WL-TM-94-3132

PRESSURE MEASUREMENTS ON AN F/A-18 TWIN VERTICAL TAIL IN BUFFETING FLOW

VOLUME IV - BUFFET CROSS SPECTRAL DENSITIES (PART 2)



CHRIS PETTIT DANSEN BROWN MICHAEL BANFORD ED PENDLETON

AUGUST 1994

FINAL REPORT FOR 04/15/93-08/15/94

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13. ABSTRACT (Maximum 200 words)

Buffeting pressure measurements were made on the vertical tail surface of a full scale F/A-18 aircraft model in the National Full Scale Aerodynamics Complex at NASA Ames Research Center. Test variables included aircraft angle-of-attack, aircraft sideslip angle, and dynamic pressure. Accelerometers were used to obtain vertical tail accelerations. Pressure transducers were mounted on the starboard vertical tail. Steady and unsteady pressures were obtained. Unsteady pressure data were reduced to PSD and CSD forms. Both steady and unsteady RMS pressure coefficients are also presented.

Volume 1 contains the general description of the model, the test program, and highlights of the reduced data. Volume 2 contains steady and unsteady RMS data. Volume 3 contains unsteady PSD results. Volume 4 contains unsteady CSD results.

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Foreword

This report was prepared by the Structural Dynamics Branch, Structures Division, Flight Dynamics Directorate, Wright Laboratory, Wright Patterson Air Force Base, Ohio. The wind tunnel test program described in this report was conducted during a joint NASA, Navy, and Air Force F/A-18 test program conducted at the NASA Ames Research Center. The wind tunnel data taken by Wright Laboratory engineers during the F/A-18 wind tunnel test was acquired in support of Project 2401, "Structural Mechanics", Task 240104, "Vibration Prediction and Control, Measurement, and Analysis" and Work Unit 24010446, F-18 Twin Vertical Tail Buffet. The project engineers for this effort were Mr. Ed Pendleton and Mr. Chris Pettit. Mr. Dansen Brown, a mathematician, provided engineering analysis support for reduction of the test data. Mr. Mike Banford was the lead technician responsible for instrumentation and data collection.

The authors wish to thank the NASA Ames F/A-18 Wind Tunnel Test Team for their cooperation during testing of the F/A-18, especially Mr. Gavin Botha, Ms. Wendy Lanser, Mr. Kevin James, Mr. Roger Stewart, and Mr. Roy Arakaki. The authors also wish to thank Dr. Holt Ashley of RANN Corporation, Mr. Marty Ferman formerly of McDonnell Douglas Corporation and now at Parks College, and Dr. James Olsen for their technical advice and suggestions during the preparation of this report. The authors further thank Mr. Larry Dukate for his assistance in reducing test data; and Mr. Mike Hart, Mr. Scott Harris, and Mr. Dick Talmadge for their technical assistance during the instrumentation phase of the test program.

This manuscript was released in August 1994 for publication as a Technical Memorandum. This report covers technical work conducted from March 1993 through August 1994.

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Section I

Introduction

Contemporary twin-tail fighter aircraft may encounter high frequency empennage vibrations caused by flow emanating from the forebody or wings during high angle-of-attack maneuvering. This turbulent flow occurs when the air flow on the forebody or upper wing surfaces becomes detached at high angles of attack. The separated flow becomes turbulent, resulting in fluctuating pressures on the wings and other surfaces in the flow path.

The induced unsteady pressures, commonly referred to as buffet, are broad-band random fluctuations having predominant frequencies associated with the primary airflow characteristics of the aircraft. These primary airflow properties may include, but are not limited to, vortex flow from engine inlets, sharp corners, and highly swept lifting surfaces. In the current application, the turbulent flow excites tail surfaces embedded in the flow, and large oscillatory structural responses result at the resonant frequencies of the tail. After prolonged exposure to this flow environment, the tail structure can begin to fatigue and repairs must be initiated. The maintenance costs and aircraft down time associated with these repairs are often quite high. To reduce these costs, the tail structure and associated equipment must be designed to both minimize and tolerate these oscillatory responses.

One twin-tail fighter aircraft that often encounters tail buffet when conducting air combat maneuvers at high angles-of-attack is the F/A-18. In an effort to quantify the F/A-18 tail buffet loads and to provide data for use in the development of potential solutions to counter the twin tail buffet problem, wind tunnel tests were conducted to measure the aerodynamic pressures on the twin tails of an F/A-18. Buffet pressures and the resulting structural vibrations of the vertical fins were obtained over a range of angle of attack and sideslip conditions.

Volume IV of this technical report presents the Cross Spectral Densities (CSDs) of the unsteady pressures and accelerations measured on the F/A-18's vertical tails during selected wind tunnel test conditions. This volume is bound in two parts: Part 1 contains various pressure

and acceleration cross spectral densities from the $\alpha=20^\circ$, $\beta=0^\circ$ test conditions, and Part 2 presents CSDs from the $\alpha=32^\circ$, $\beta=0^\circ$ test conditions. Volume I of this report presents a general description of the full scale aircraft model and the test program. Volume II presents results from both steady and unsteady pressures, obtained during high buffer flow conditions. Volume III of this technical report presents the Power Spectral Densities (PSD) of the measured aerodynamic pressures and accelerations.

Section II

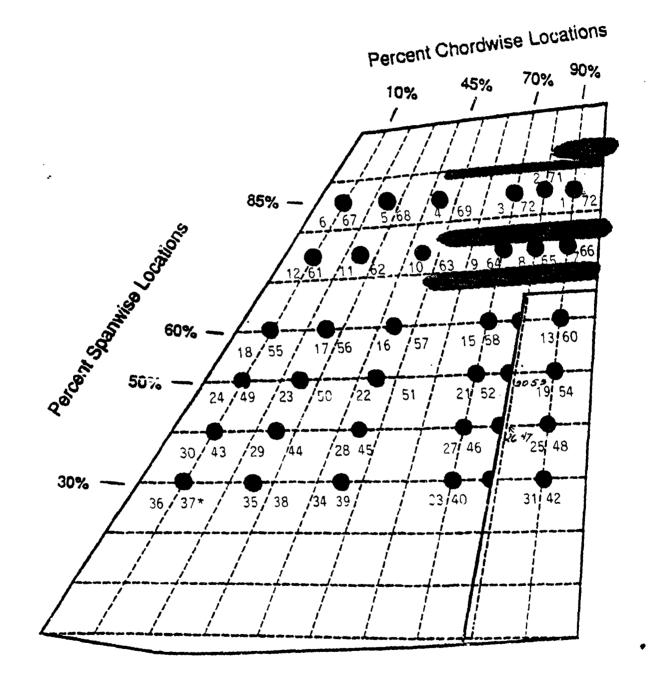
Cross Spectral Densities of Unsteady Pressure Coefficients and Accelerations

The wind tunnel buffet tests were conducted during a ten day period in August 1993 at the NASA Ames NAFC 80-by-120 foot tunnel in Mountain View, California. Unsteady pressure measurements, as well as acceleration data, were obtained for sixty-three (63) test conditions. Four of the test conditions were at a dynamic pressure of $20 \, lb/f^2$, and fifty-nine of the conditions were at the maximum tunnel dynamic pressure of $33 \, lb \, ft^2$. During the tests, pressure measurements were collected as the static angle-of-attack, α , was varied through a range from 20 to 40 degrees at zero sideslip. Measurements were also obtained as the static aircraft sideslip angle, β , was varied from -16 to +16 deg at both 30 and 35 deg angle-of-attack. Measurements were taken both with and without the LEX fence both deployed.

Figure 1 shows the Kulite microphone pressure transducer locations along the F/A-18's twin vertical starboard tail. The station number for each pair of inside and outside transducers is equivalent to the number for each outboard transducer. Accelerometers were located on both starboard and port tails at the tails' tips close to the leading and trailing edges.

At each test condition, steady and unsteady pressure data were recorded for 30 sec with the data acquisition system's multiplexers operating in the direct current (DC) and alternating current (AC) modes, respectively. Seventy-two channels of pressure data and four channels of acceleration data were recorded.

Pressure differential time histories were computed for each pressure transducer pair at each location by subtracting the outer time history from the inner time history. These data and the acceleration data were converted to the frequency domain using Fast Fourier Transform techniques. A transform size of 2048 resulted in a frequency resolution of approximately $\Delta f = 0.8$ Hz. A Hanning window was applied to reduce the bandwidth leakage, and an average of 22



- Pressure Transducer Locations, both sides of tail fin Surface Obstructions

*36 37 - Outboard Tranducer # - Inboard Tranducer #

Figure 1. Six by six grid of pressure transducers.

transforms with a 50% overlap was used to increase statistical confidence. Power Spectral Densities (PSDs) were then computed from the Fourier transforms, and the results were plotted from 2 Hz to 120 Hz. The total record time of T = 15 sec was determined to be sufficiently long with a sampling interval of $\Delta t = 611.77$ µsec. The resulting PSDs may be found in Volume III of this report.

Cross Spectral Densities (CSDs) were computed for the $\alpha = 20^{\circ}$ and 32°, zero sideslip test conditions, both with and without the LEX fence deployed. For each of these conditions, the coherence and phase angle relations between several quantities were calculated. The combinations of measured variables that were compared using cross spectral analysis included:

- i. Differential pressure coefficients at pressure transducer stations i and j. $CSD(\Delta p_i, \Delta p_i)$, where i, j = 1, 2, ..., 36.
- ii. Pressure coefficients on the inside and outside surfaces at each pressure transducer station, $CSD[(p_{in}, p_{out})_i]$ where i = 1, 2, ..., 36.
- iii. Fin-tip accelerations from accelerometers S1, S2, P1, and P2. Note that S1 and S2 are the starboard fore and aft accelerometers. P1 and P2 are defined similarly for the port fin.
- iv. Differential pressure coefficient at 10% chord, 85% span and each of the fin-tip accelerations, $CSD(\Delta p_{6,67}, z)$, where the subscript "6,67" indicates the difference between the pressure coefficients at transducer 6 and 67 in Figure 1. This comparison was directed toward a preliminary examination of motion-induced pressures (see Page 43 of Volume I). No analysis of this effect is included here since the primary purpose of this report is to organize and present the test data.

The cross spectral densities were computed using standard FFT techniques similar to those described above for the PSDs.

Following the wind tunnel test, a post-test inspection of the instrumentation was conducted to evaluate the condition of each pressure transducer. The inspection revealed that the

wire from transducer #26 had severed. All remaining transducers appeared functional, but some were slightly fouled with residue from test fogging mixture.

Reduction of the raw signals from data also revealed clues about transducer condition. Steady and unsteady data plots reduction confirmed that transducer #26 had been inoperative during the entire wind tunnel test. These pressure plots also indicated that transducer #22 had been functional for only a portion of the test and was inoperative for data records 66-79.

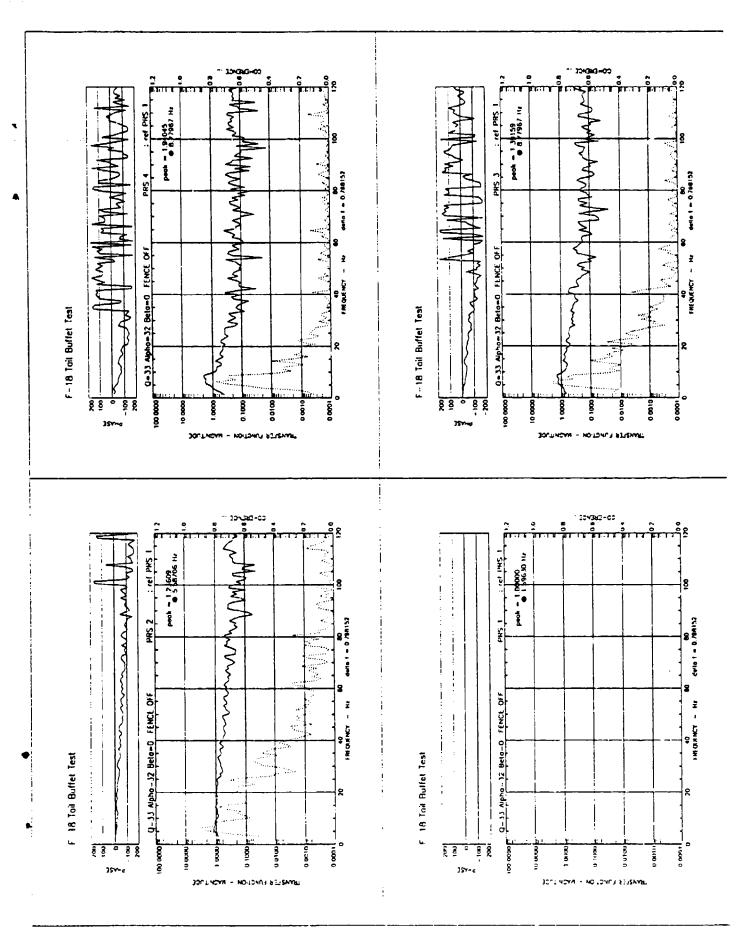
Steady pressure differences across the fin determined using transducer pairs #20 and #53 and #29 and #44 appeared to be inconsistent with the steady data from the other stations' transducers. Unsteady RMS pressure differences across the fin determined using transducer pairs #29 and #44 also appeared to be inconsistent with the unsteady RMS data from the other stations' transducers. Further inspection of the raw signals from these transducer pairs indicated that the signals from transducers #20, #53 and #44 were inconsistent with the signals from the other transducers.

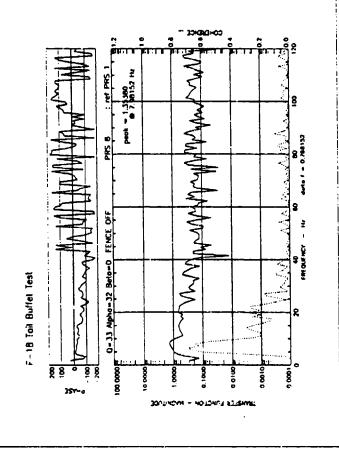
Overall, the conclusion from evidence gathered during the post test inspections and steady and unsteady data reduction is that transducers #26 was nonfunctional for all records, transducers #20, #44 and #53 were functioning improperly for all records and #22 was nonfunctional for data records 66-79.

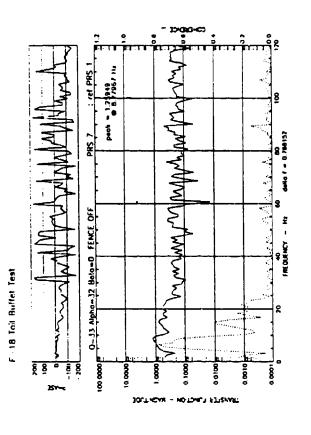
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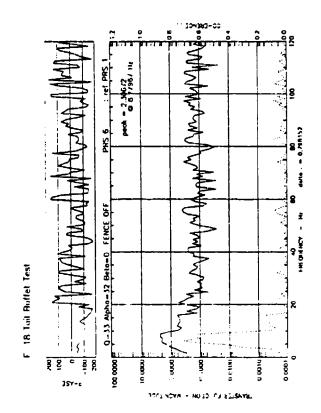
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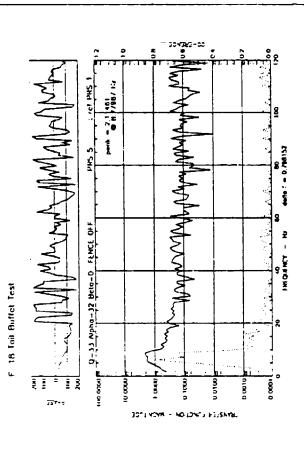
Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers being analyzed are listed near the upper right of each chart. Refer to the transducer reference numbers displayed in Figure 1.

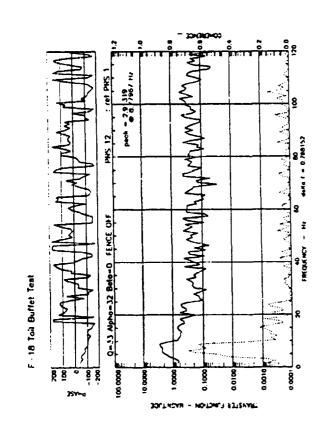


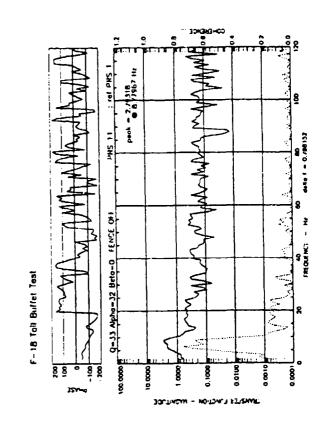


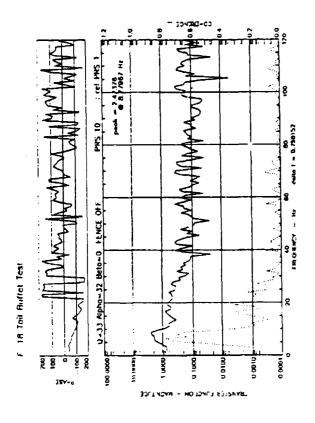


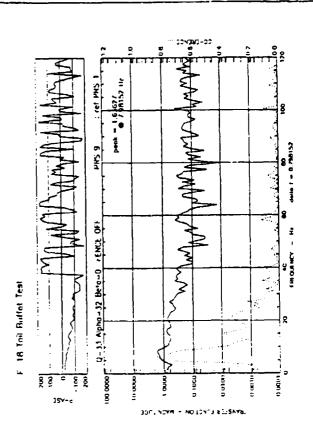


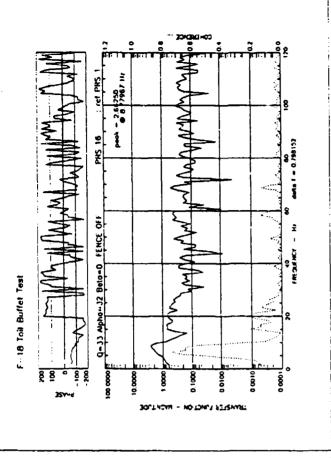


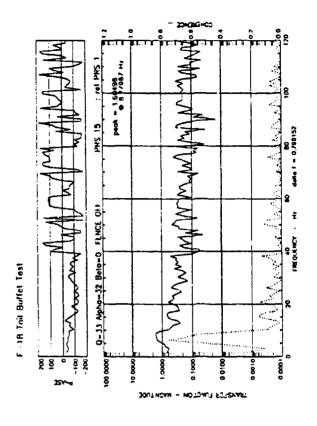


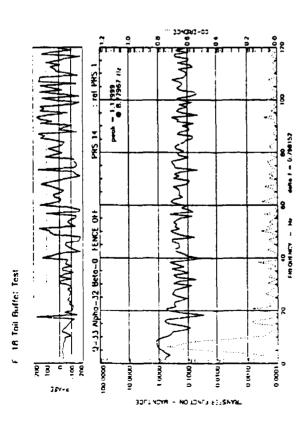


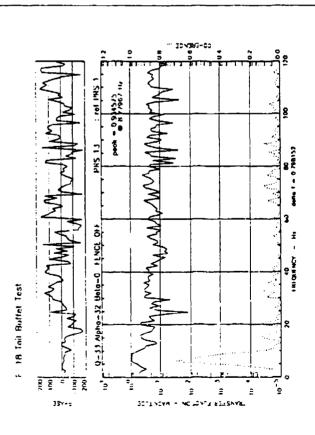


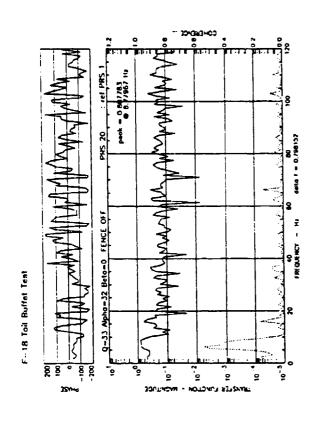


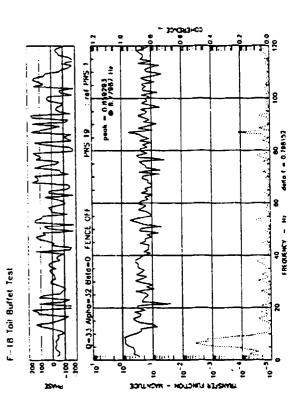


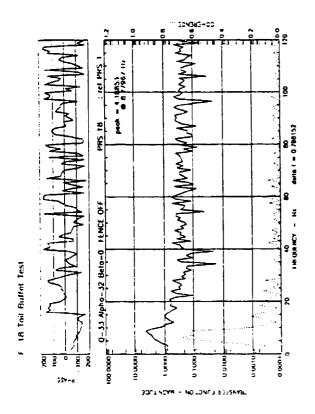


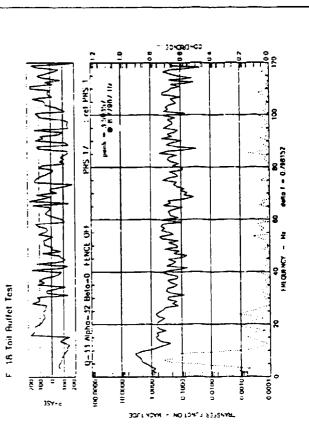


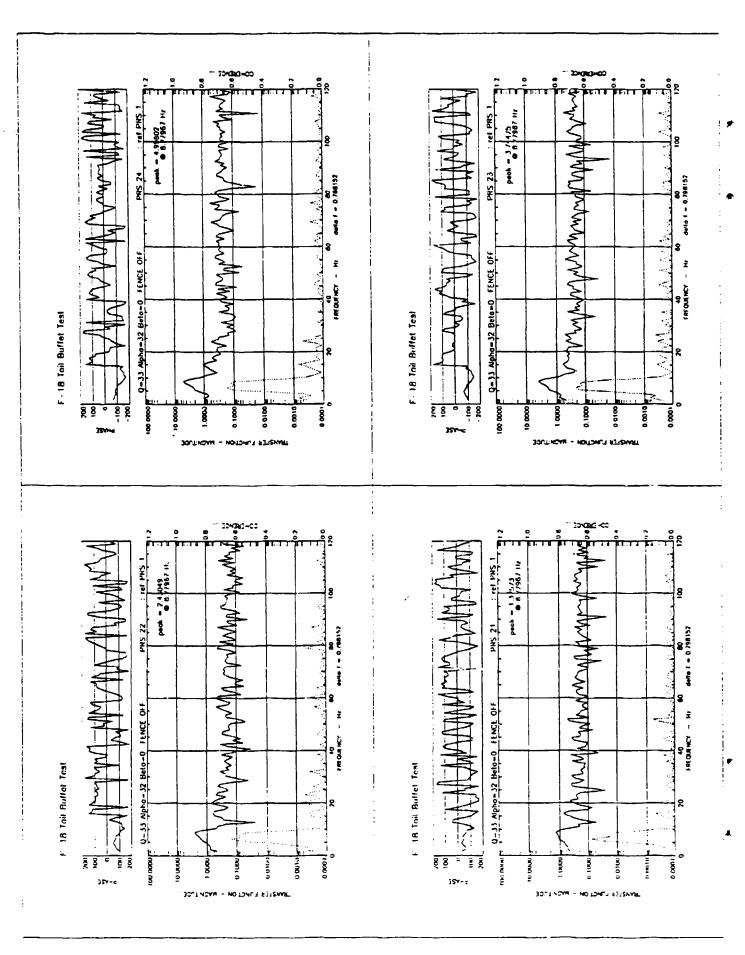


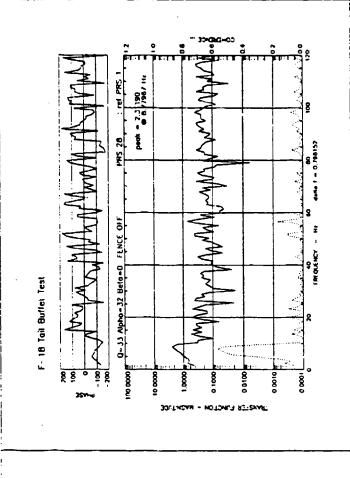


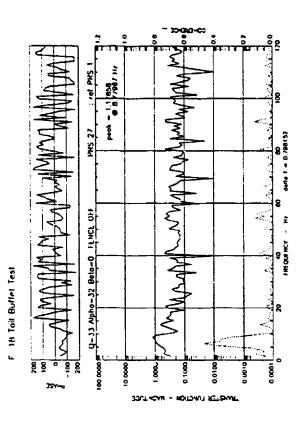


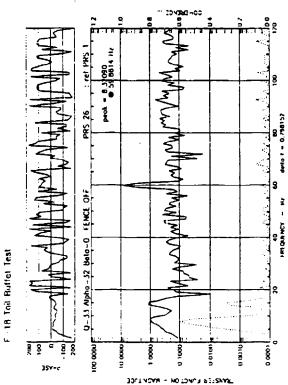


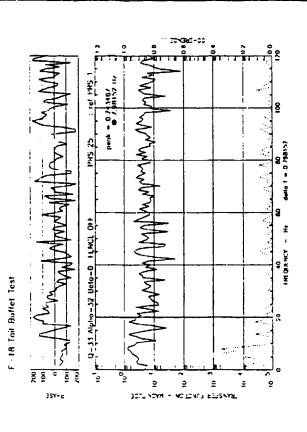


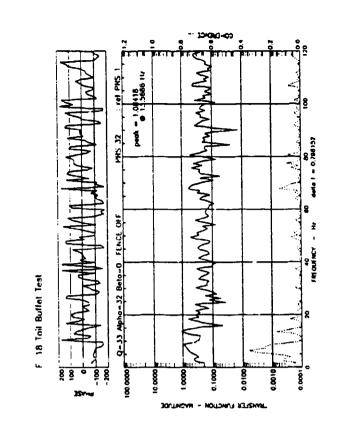


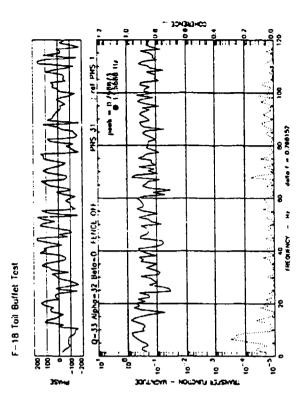


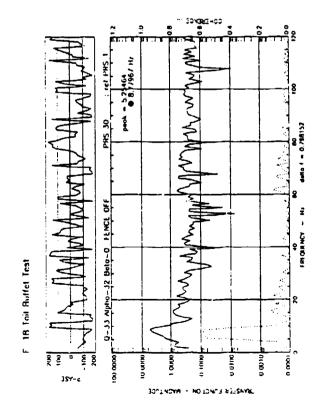


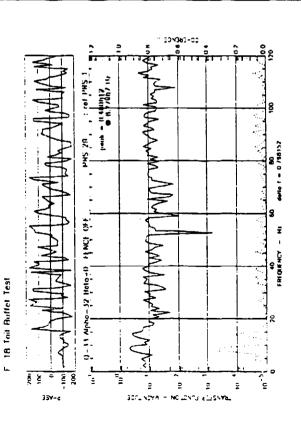


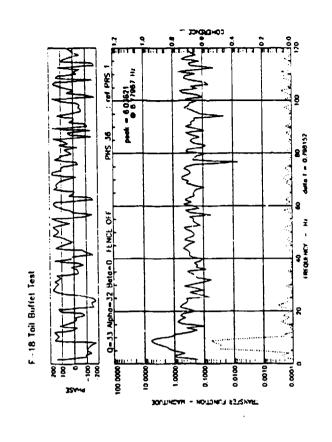


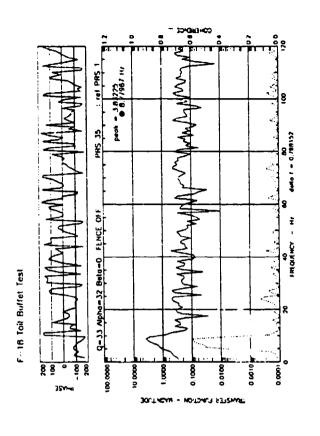


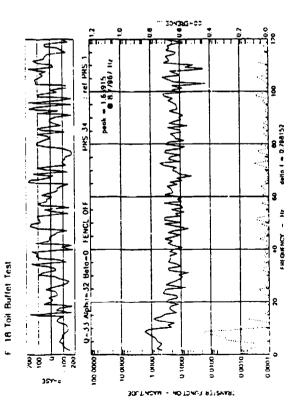


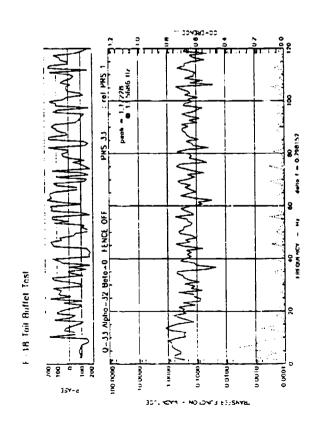


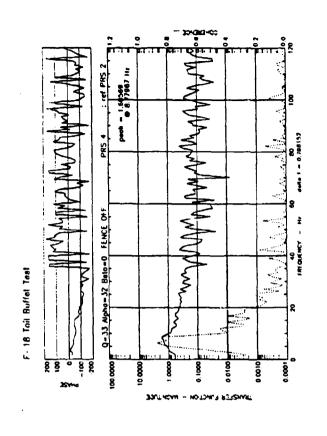


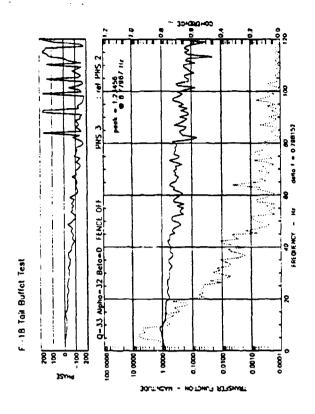


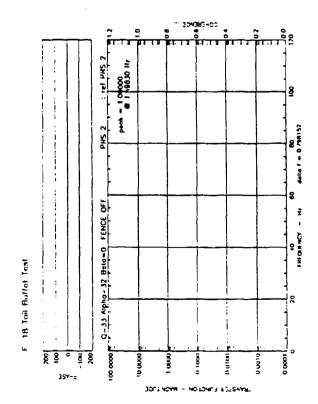


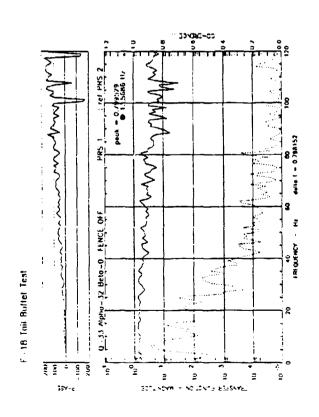


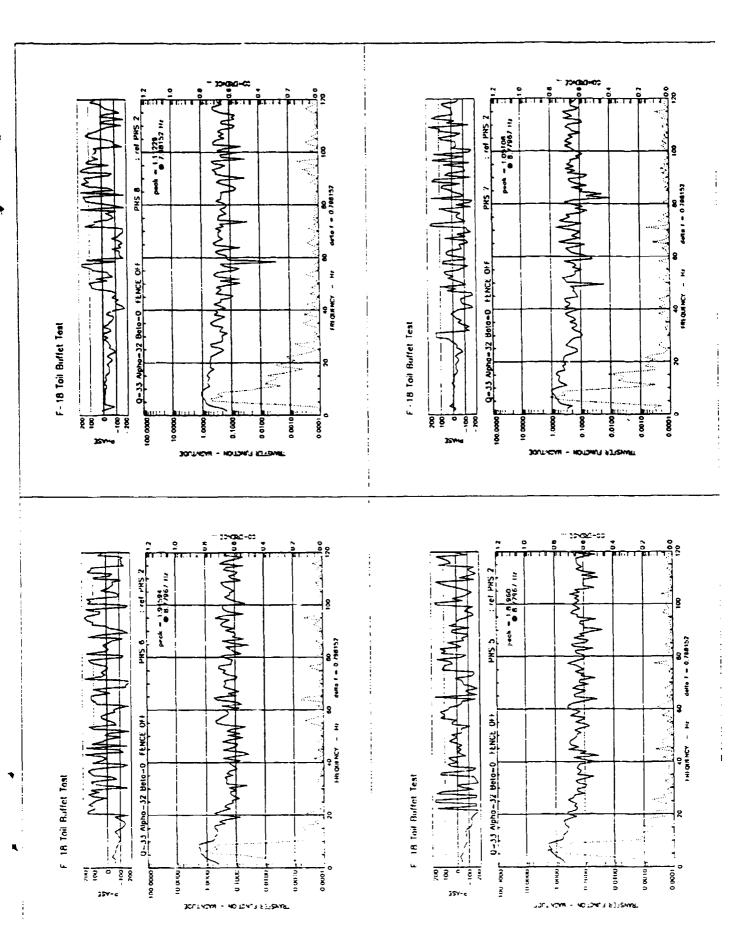


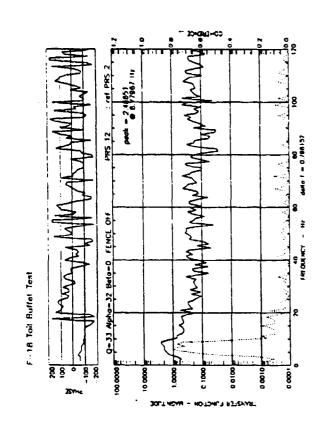


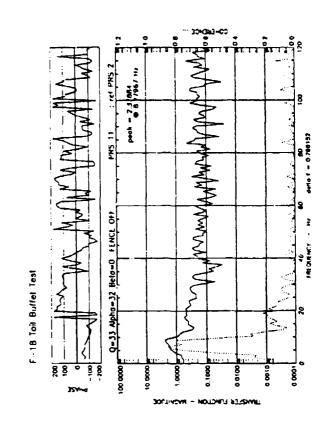


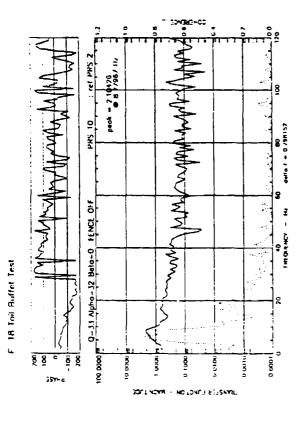


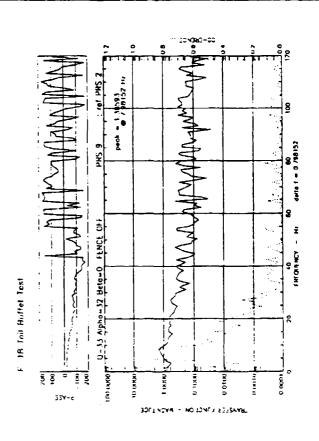


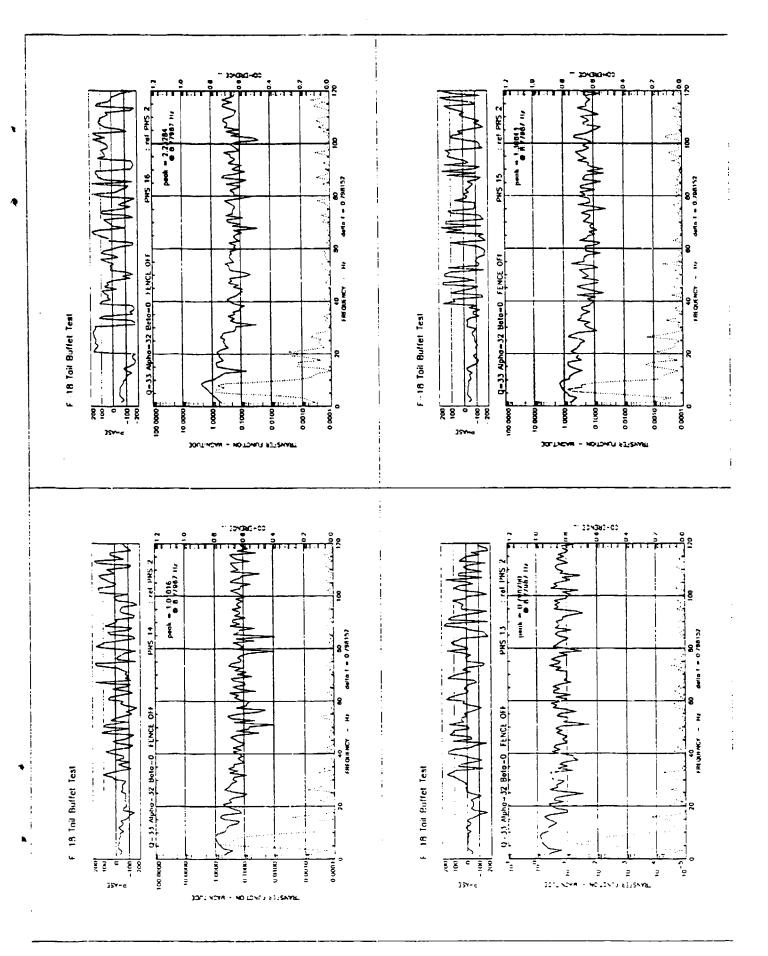




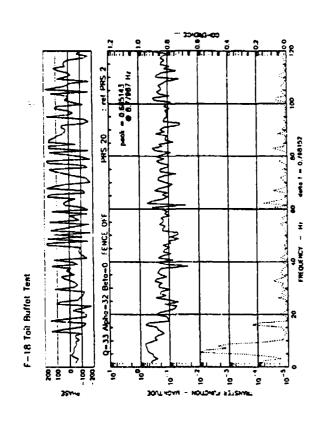


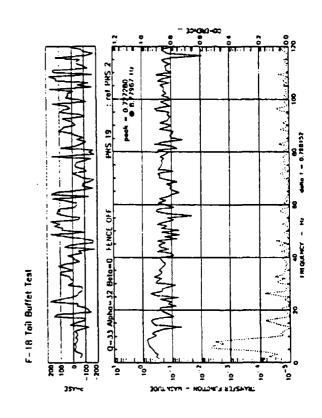


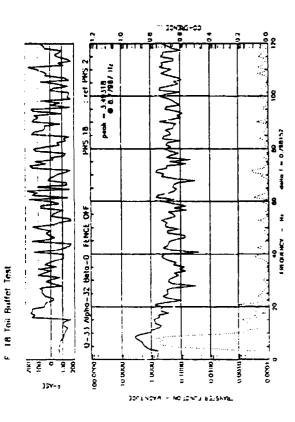


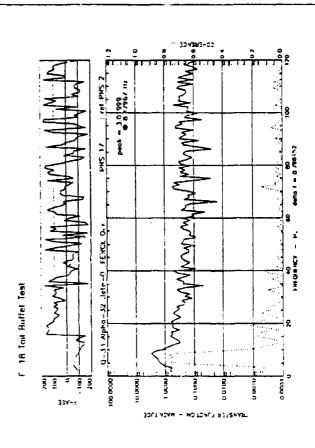


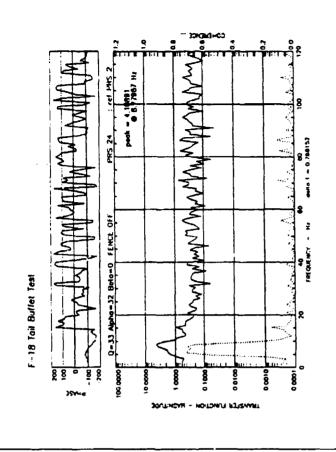
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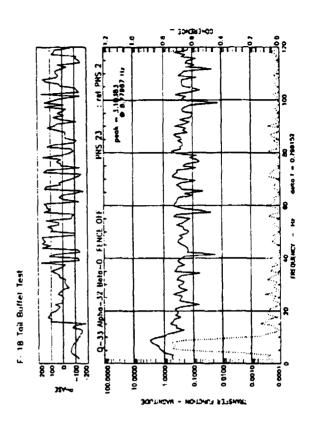


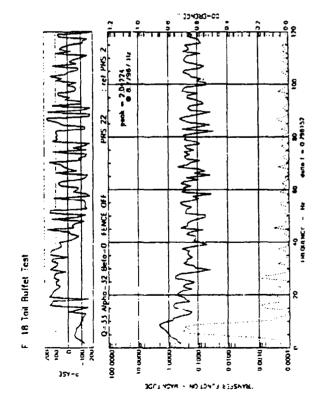


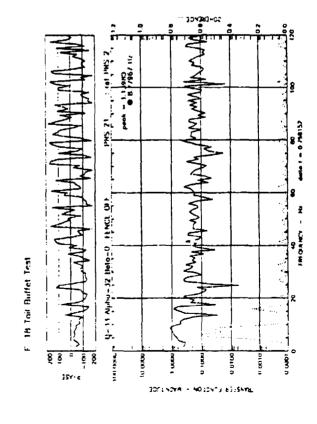


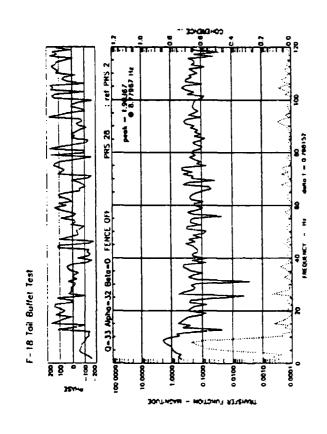


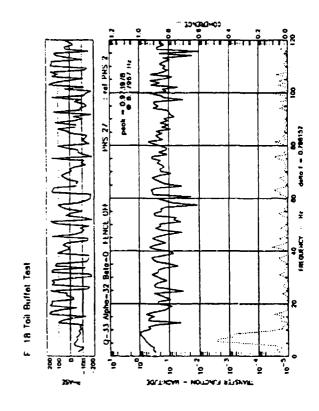


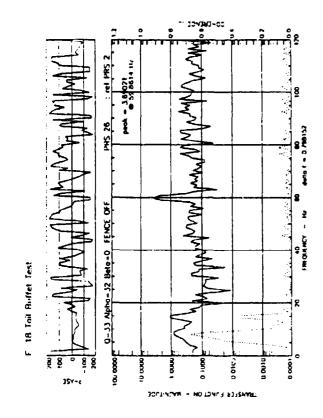


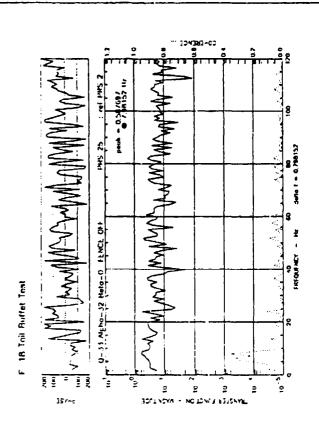


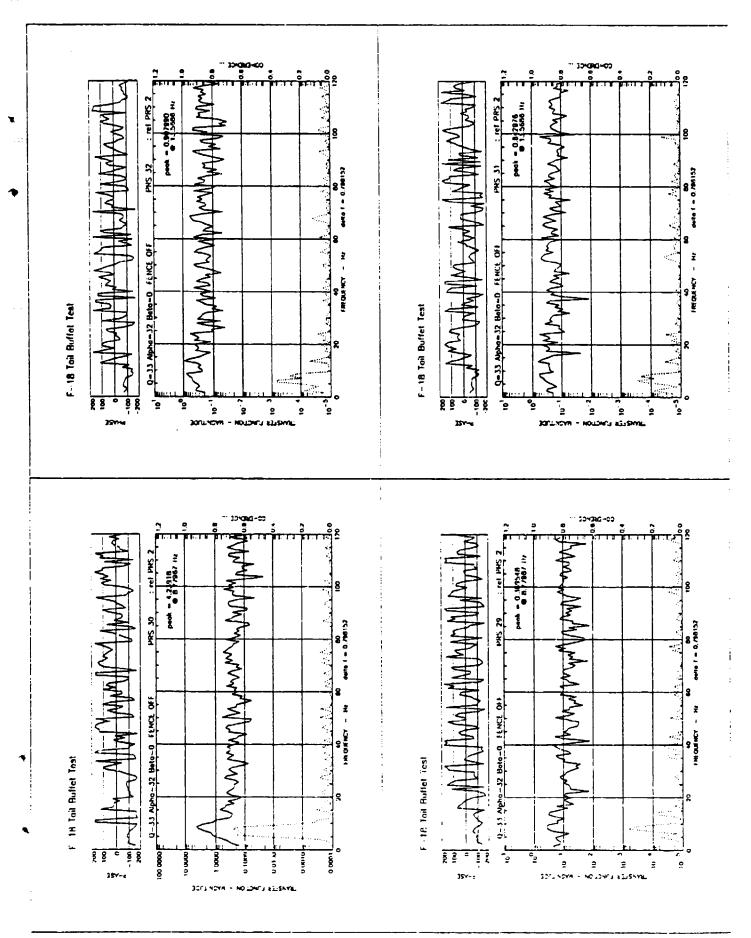


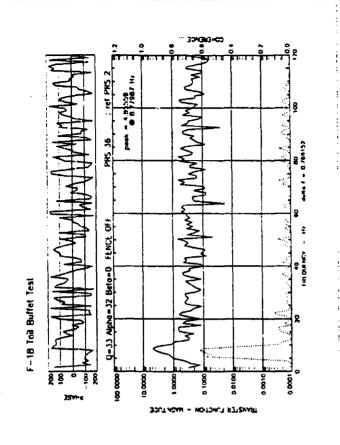


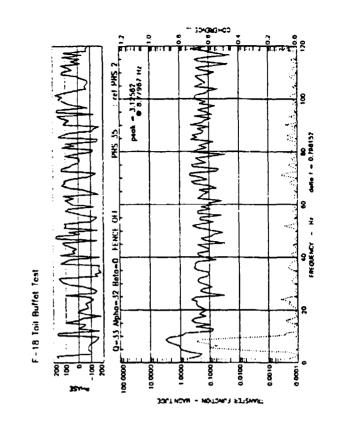


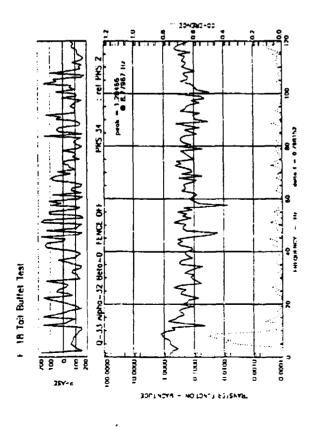


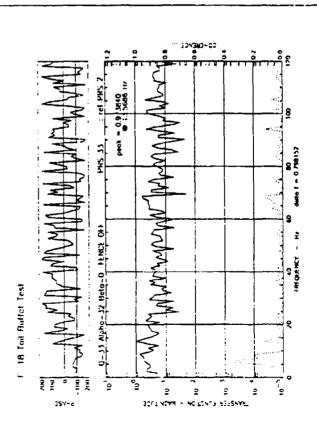


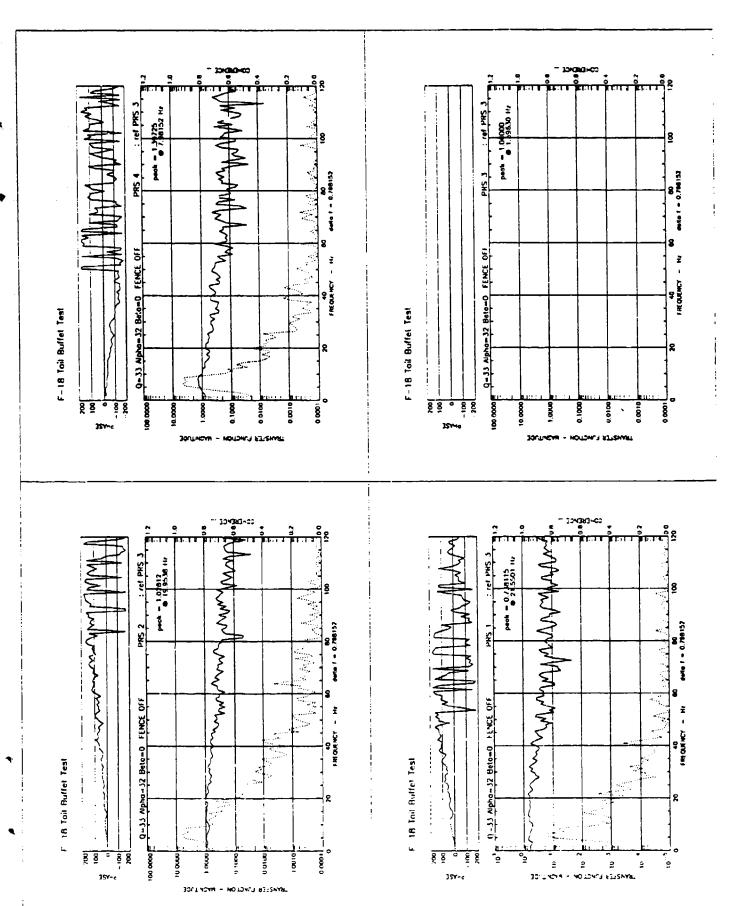


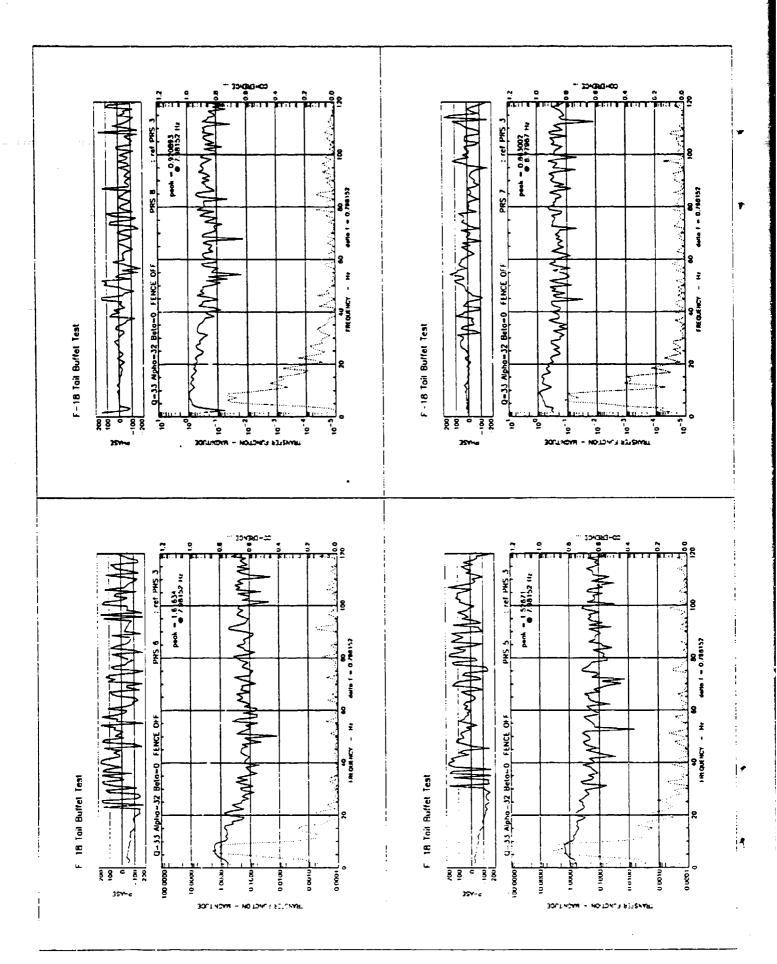


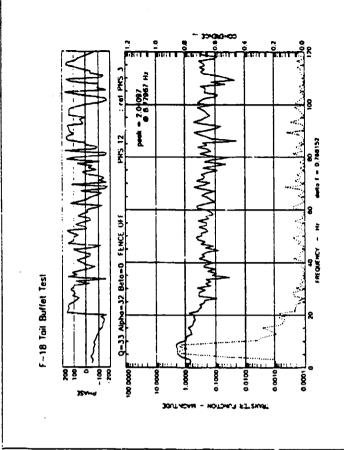


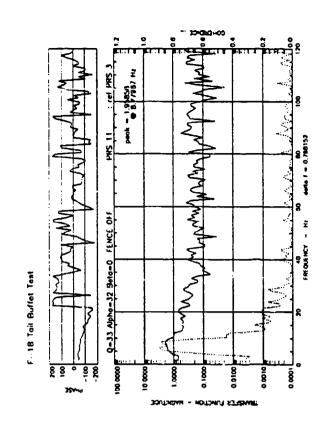


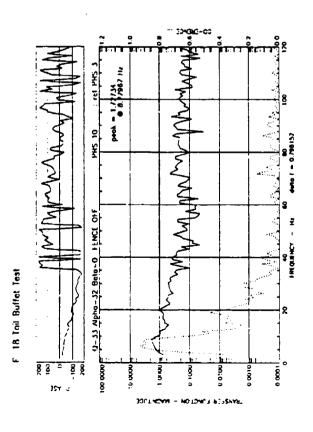


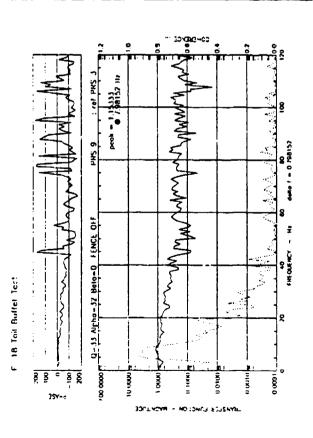


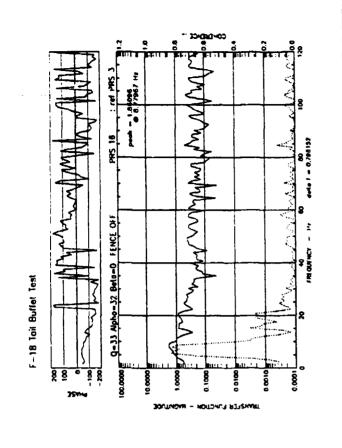


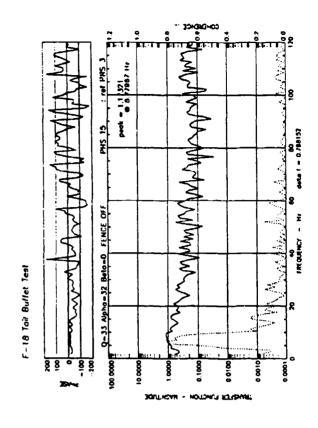


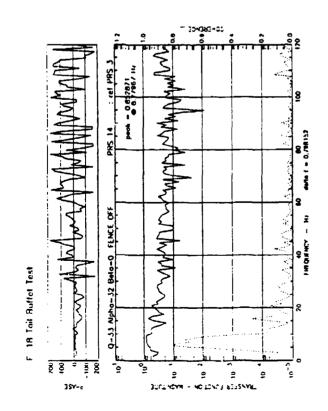


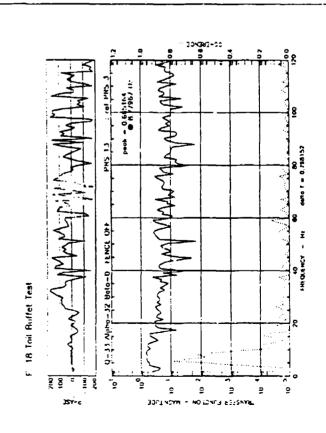


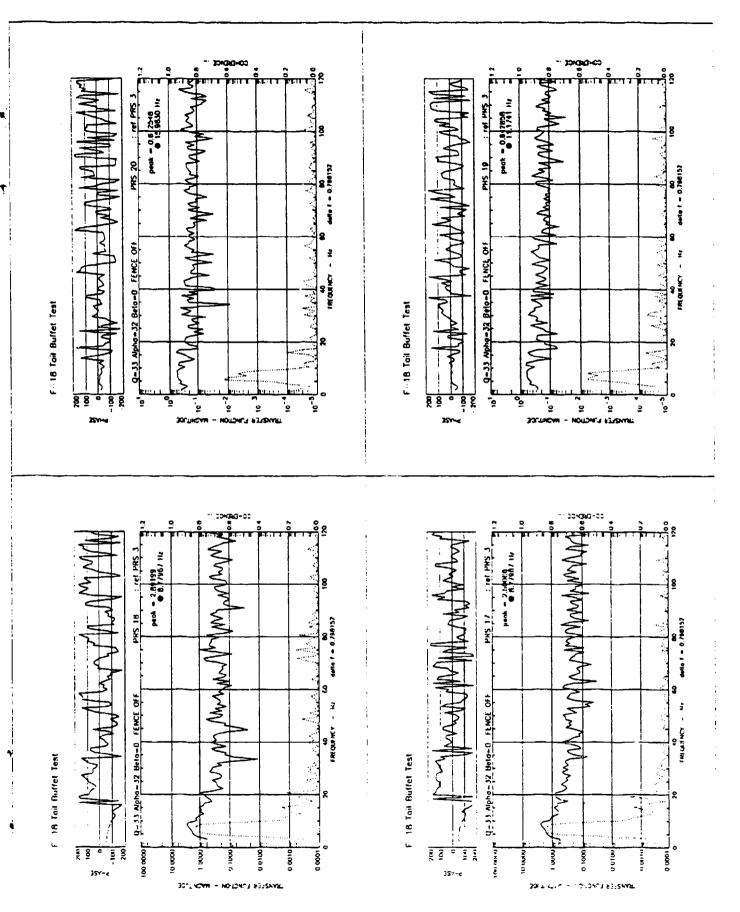


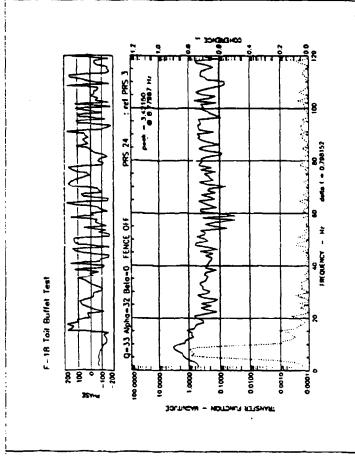


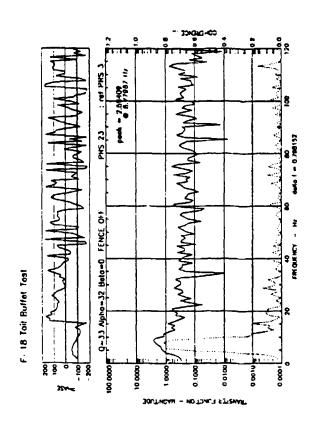


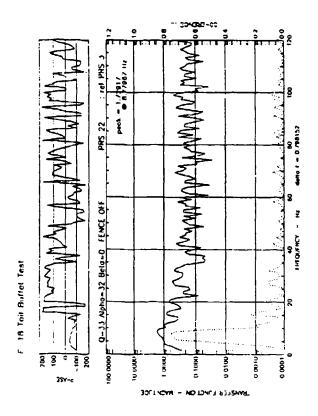


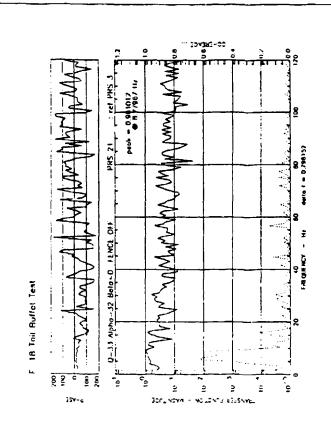


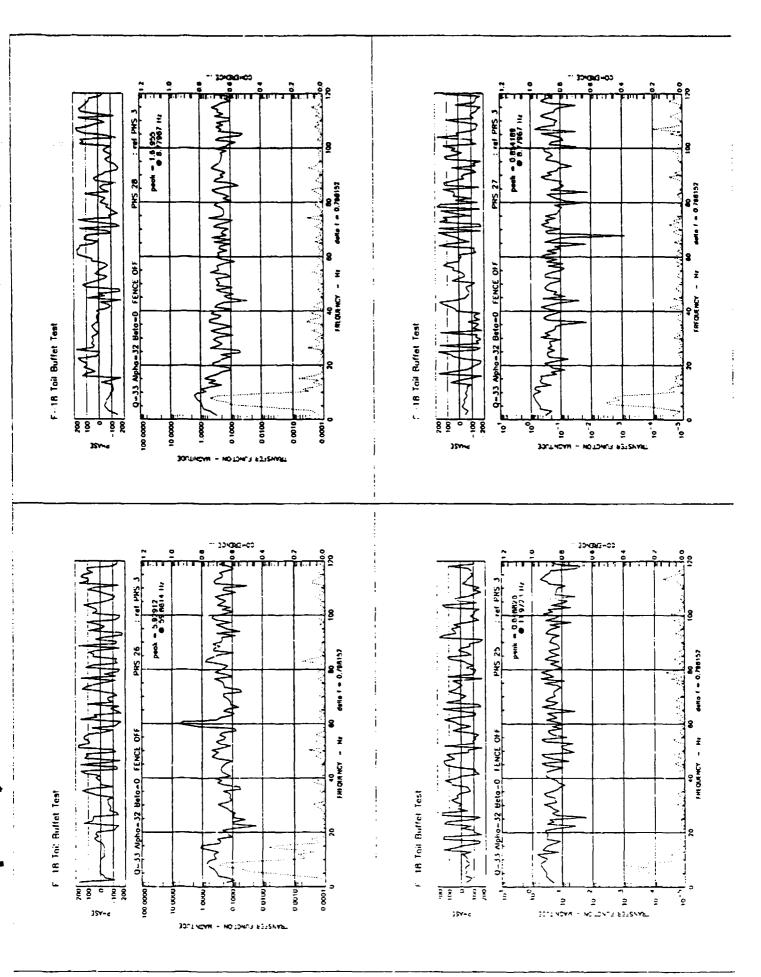


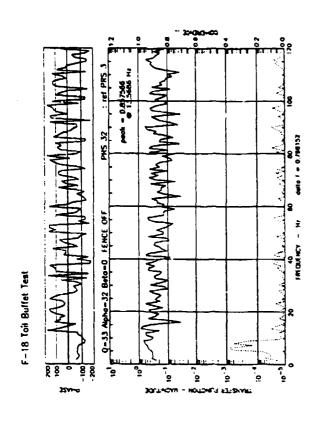


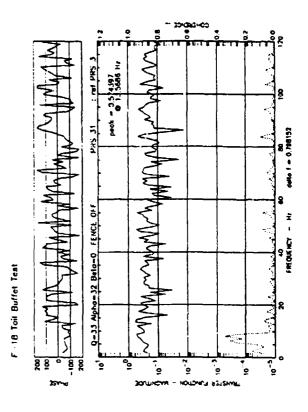


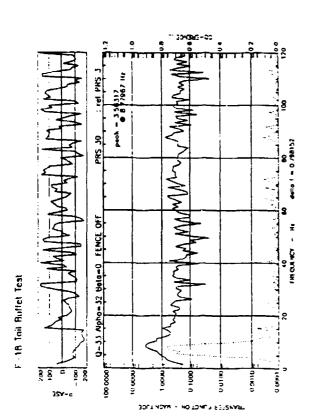


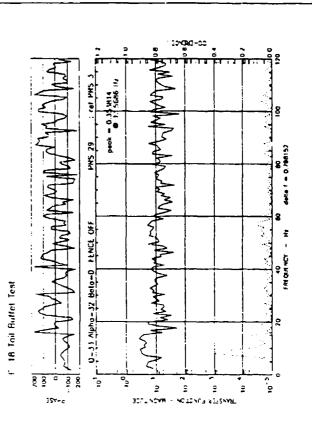


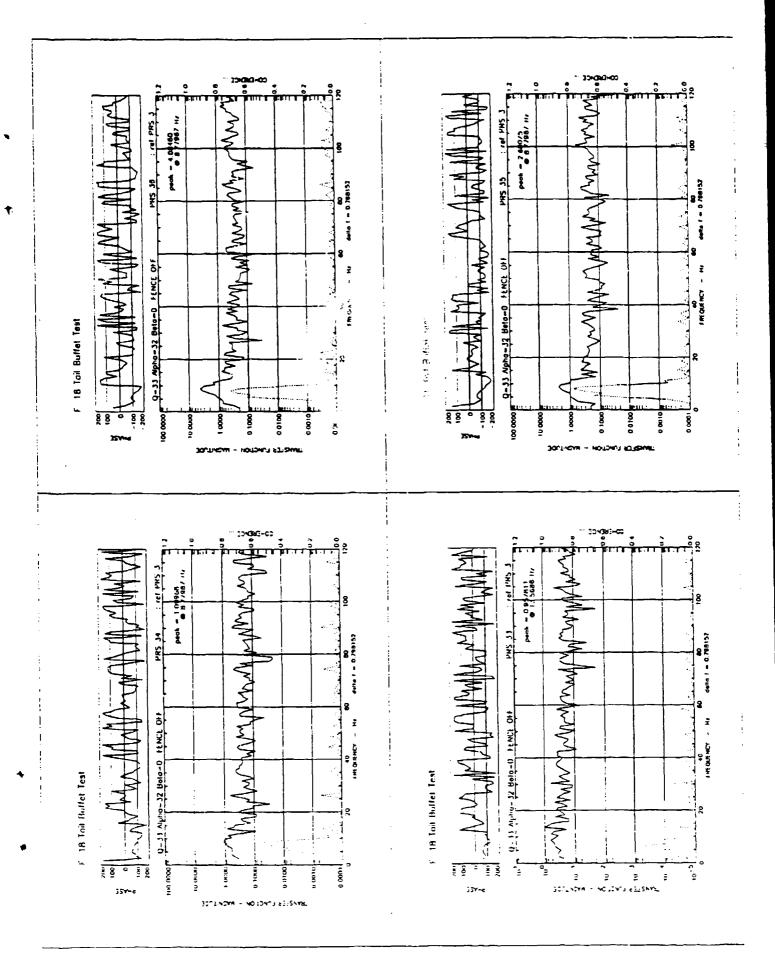


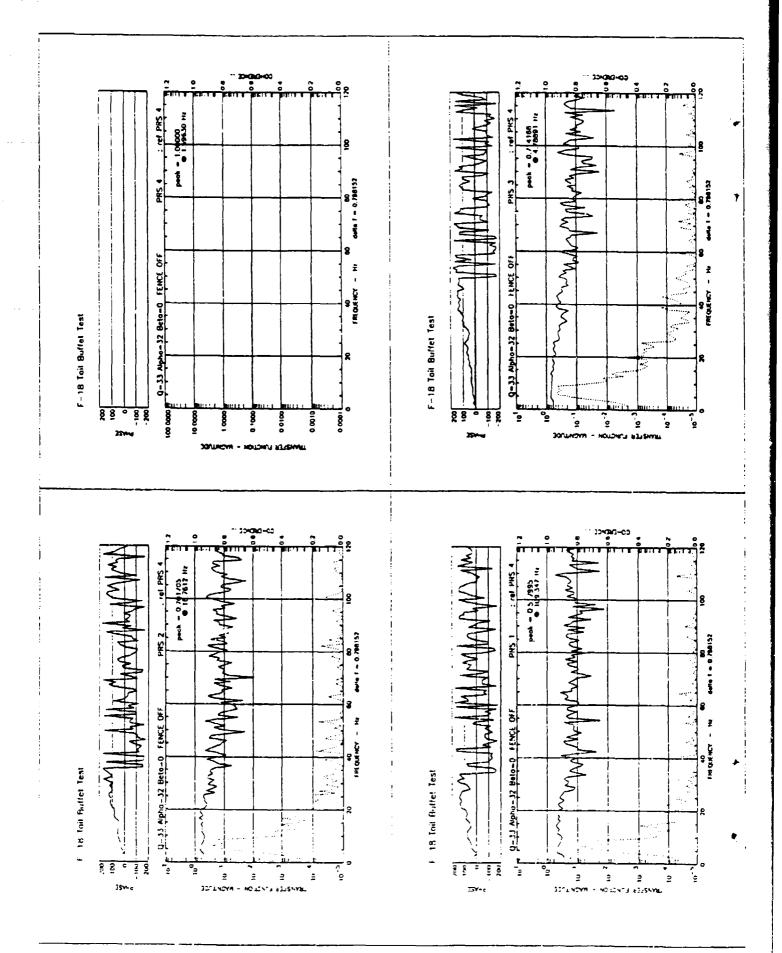


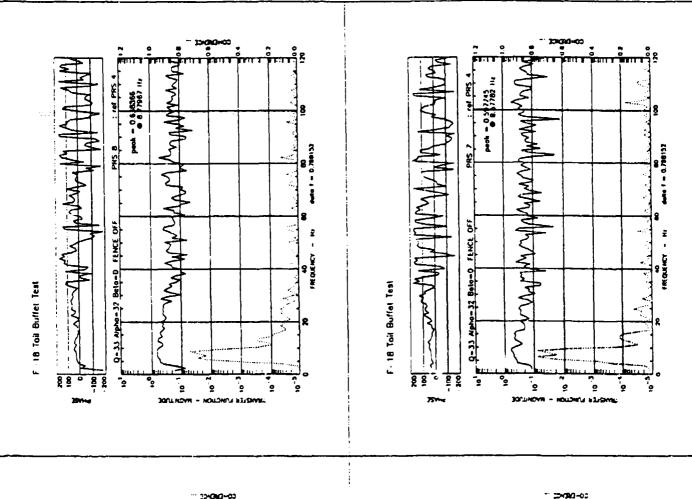


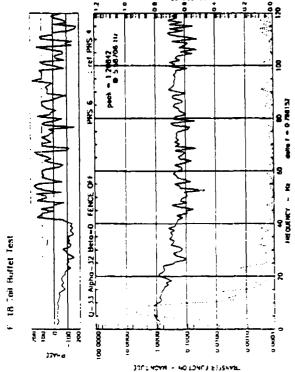


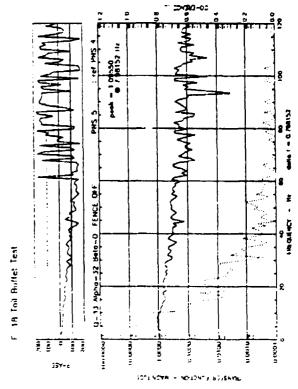


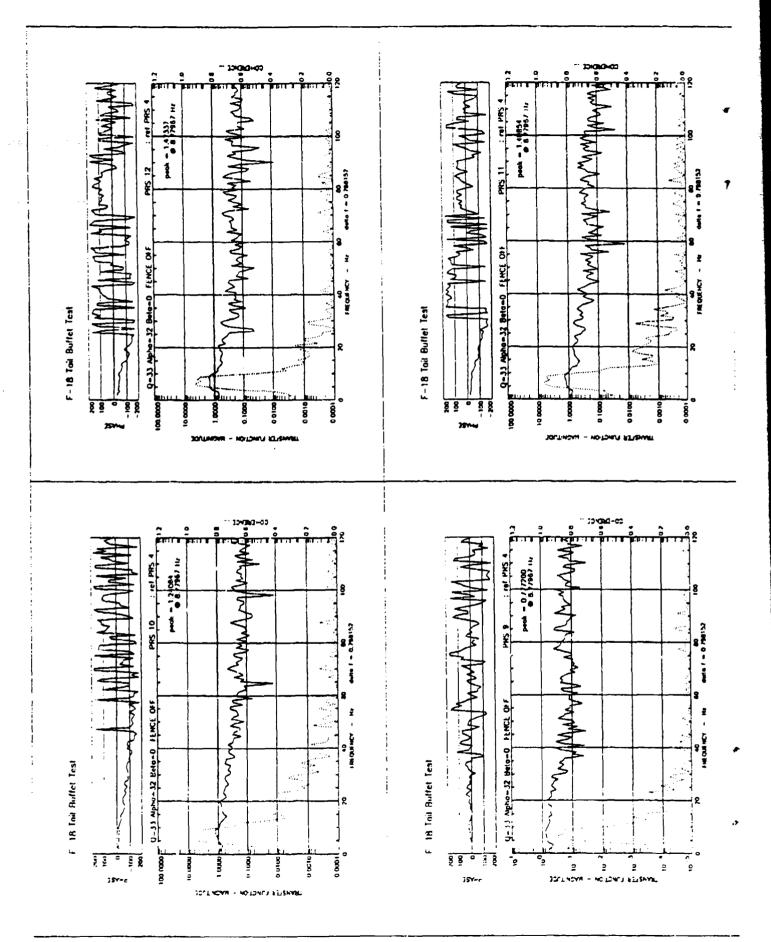


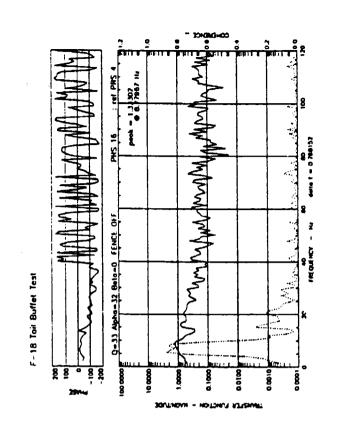


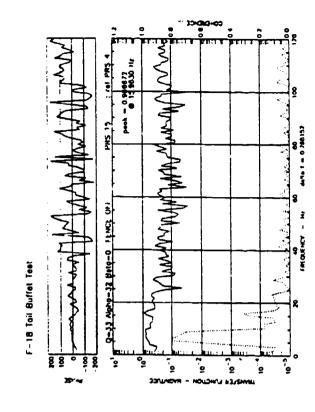


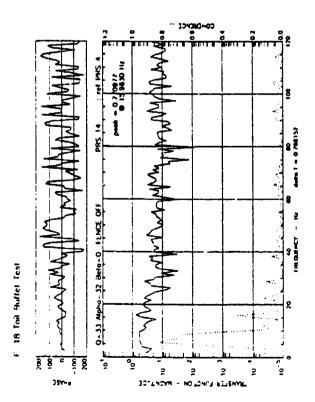


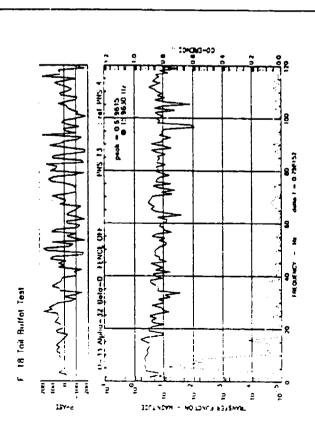


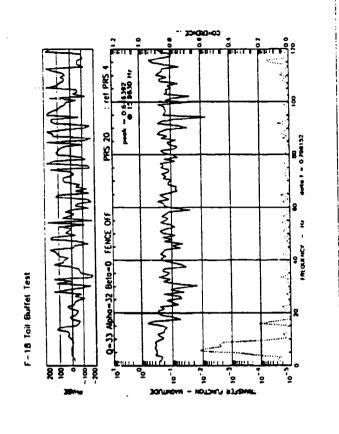


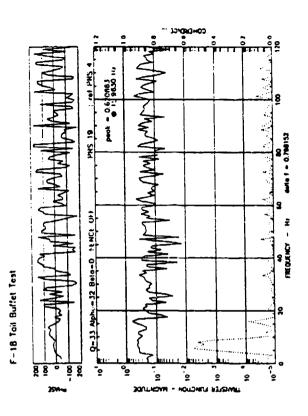


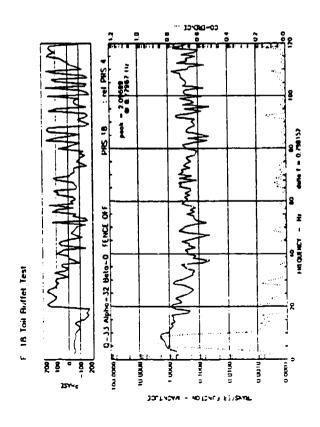


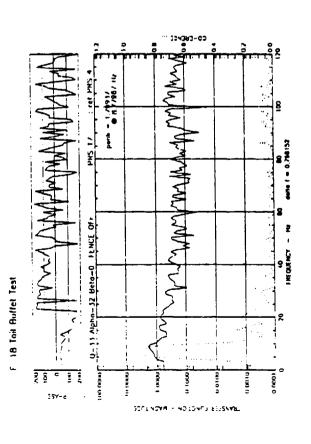


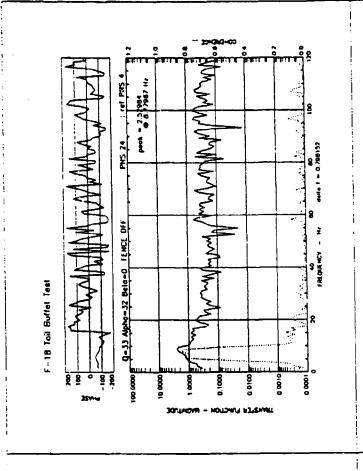


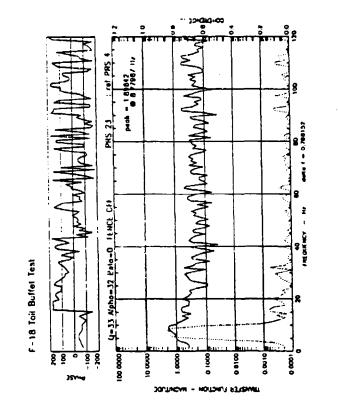


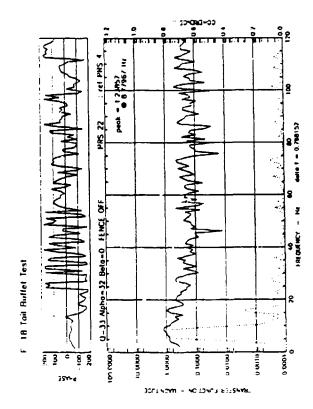


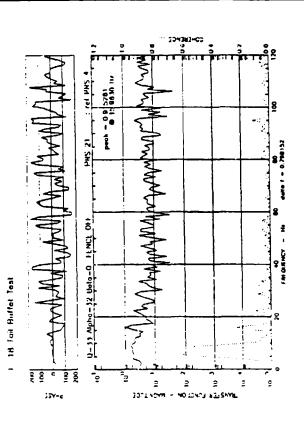


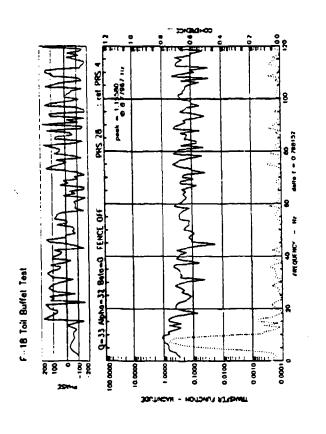


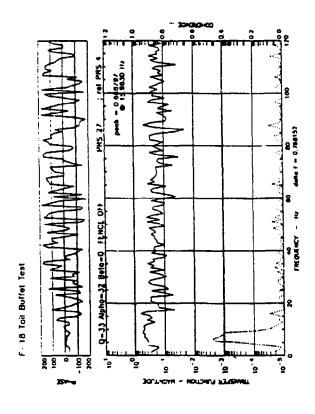


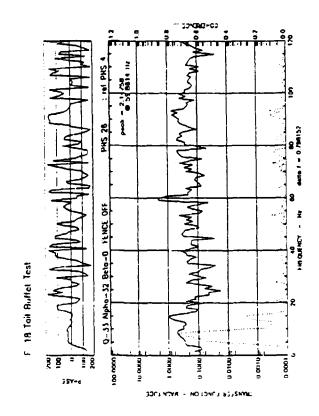


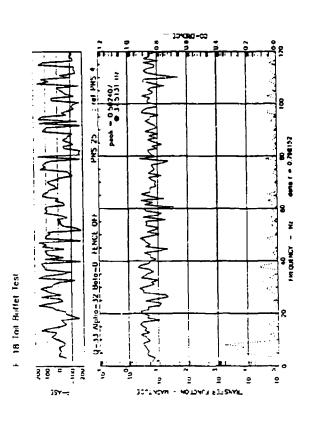


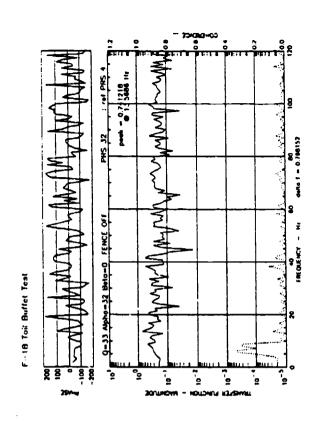


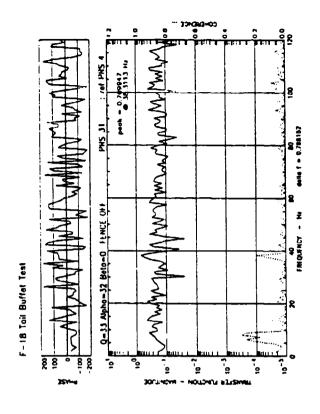


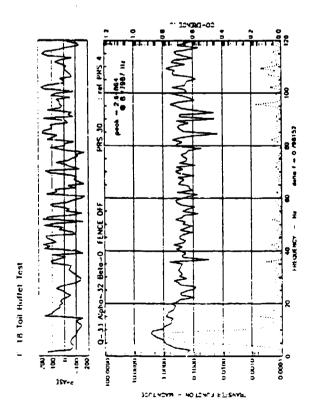


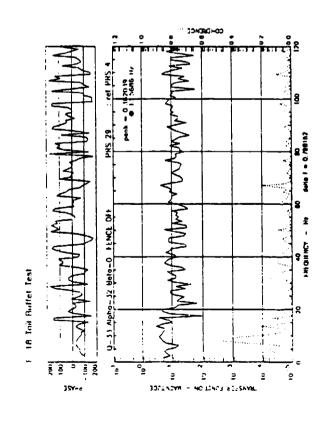


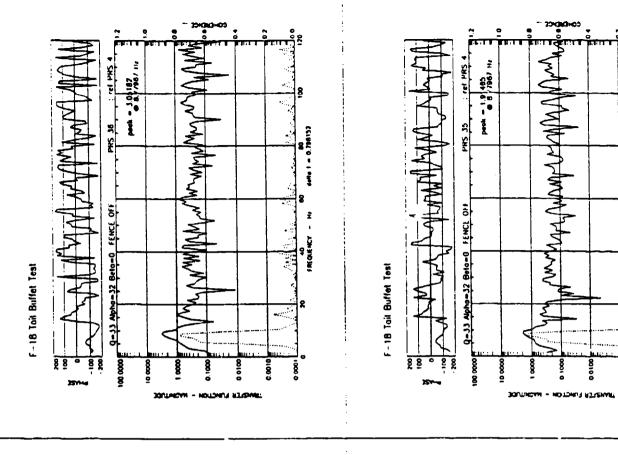


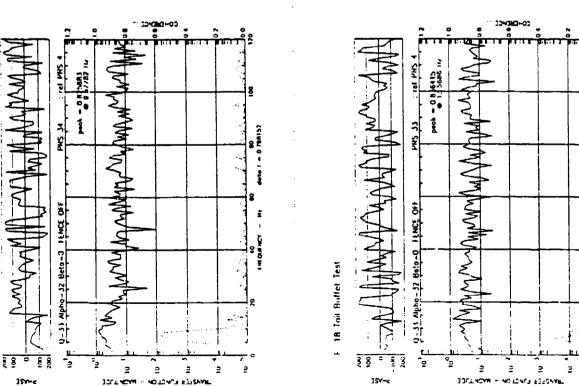




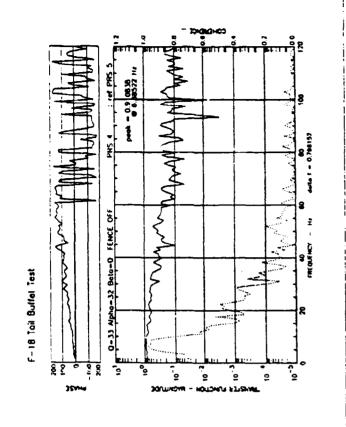


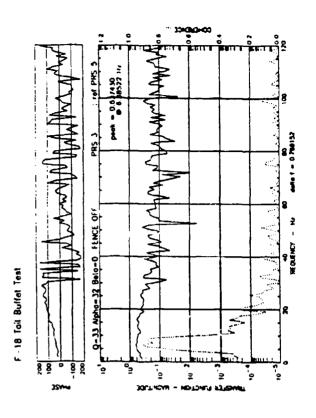


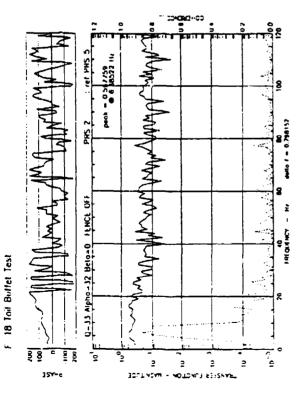


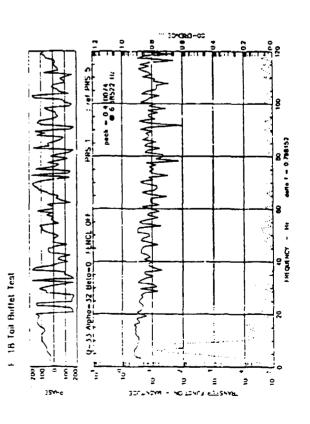


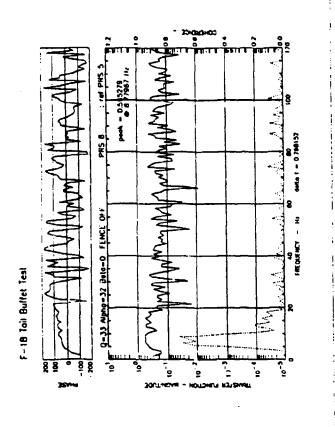
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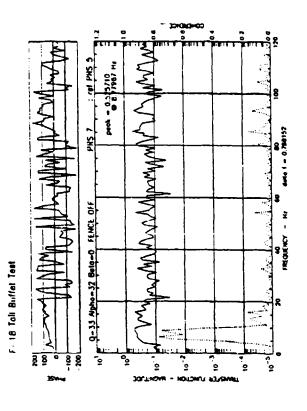


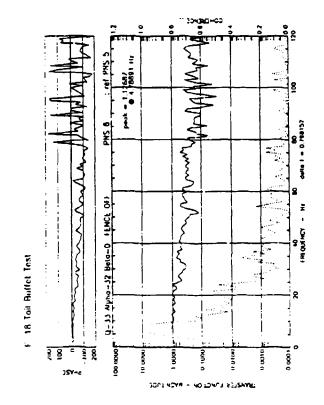


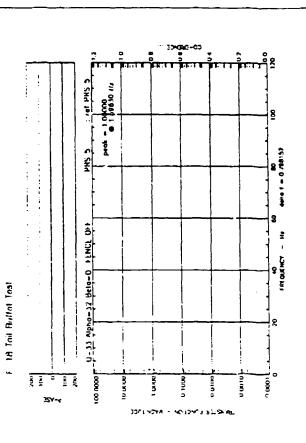


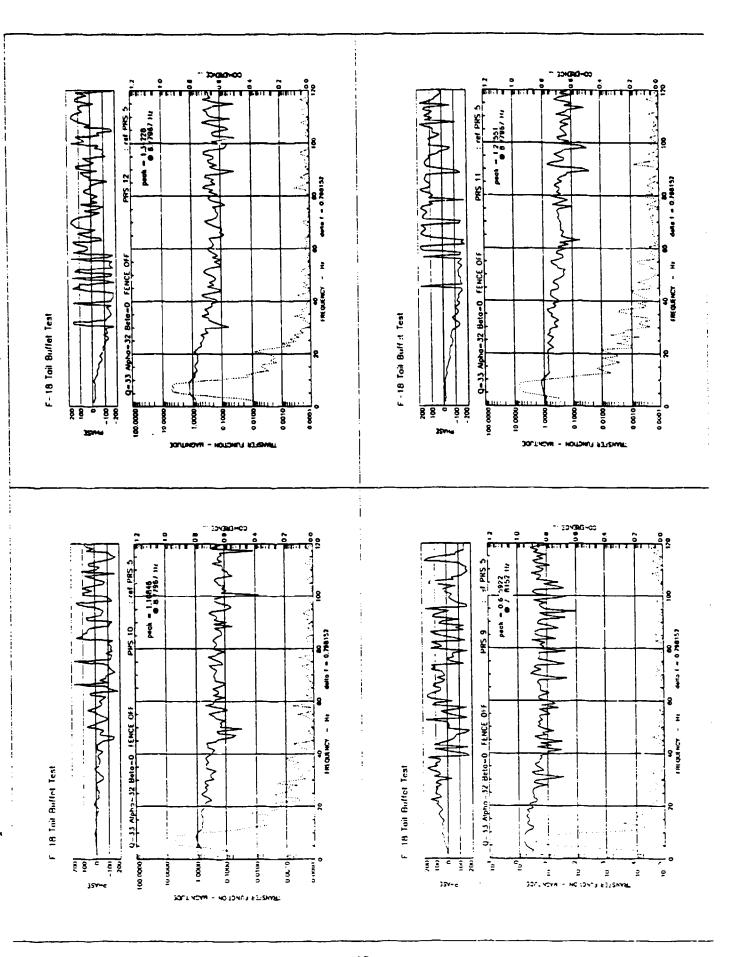




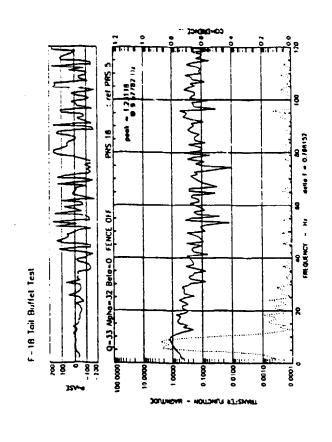




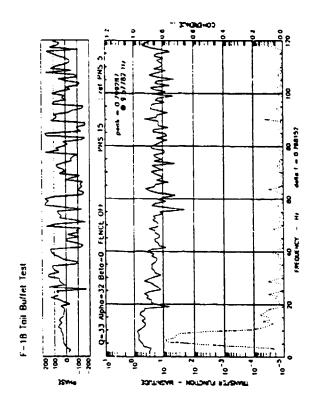


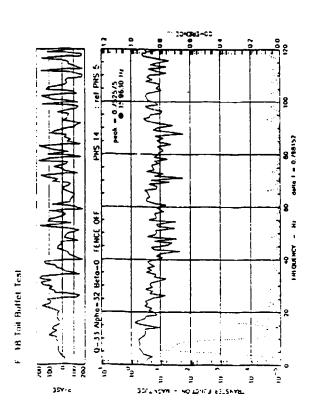


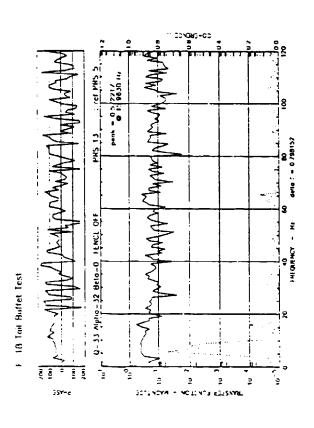
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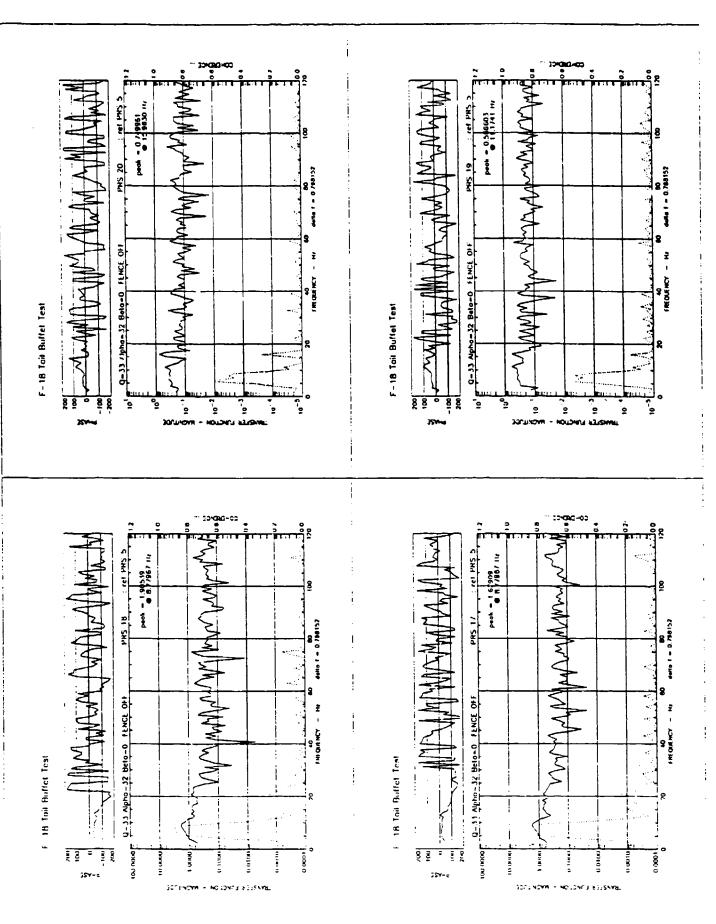


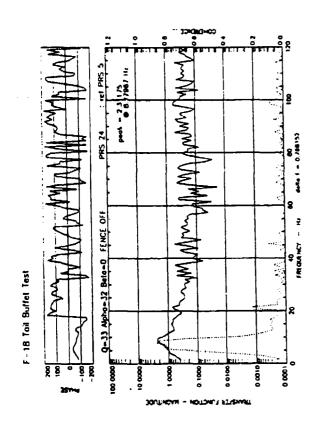
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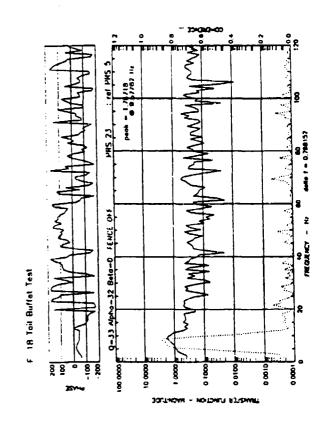


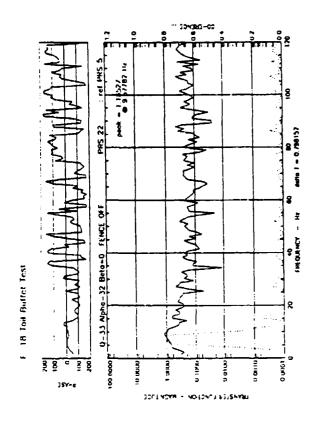


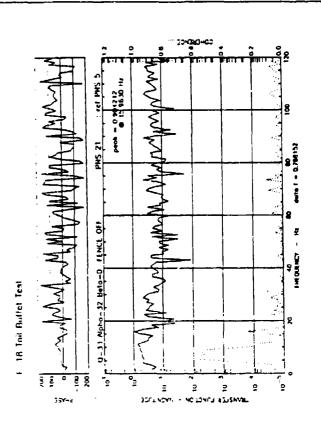


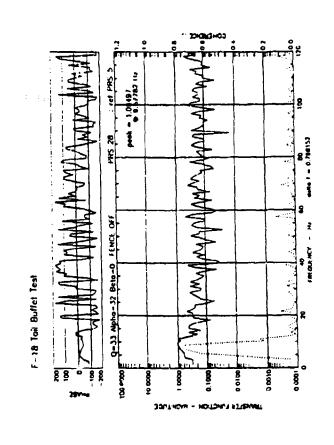


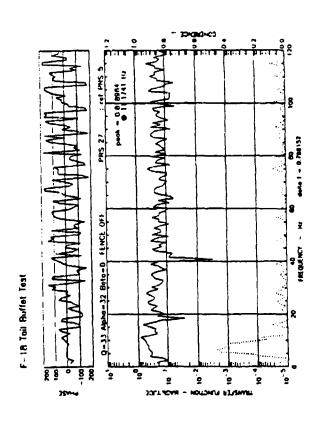


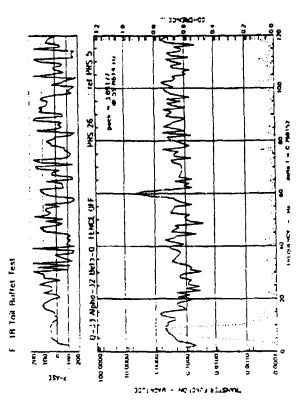


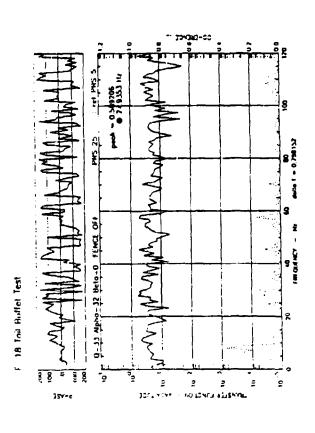


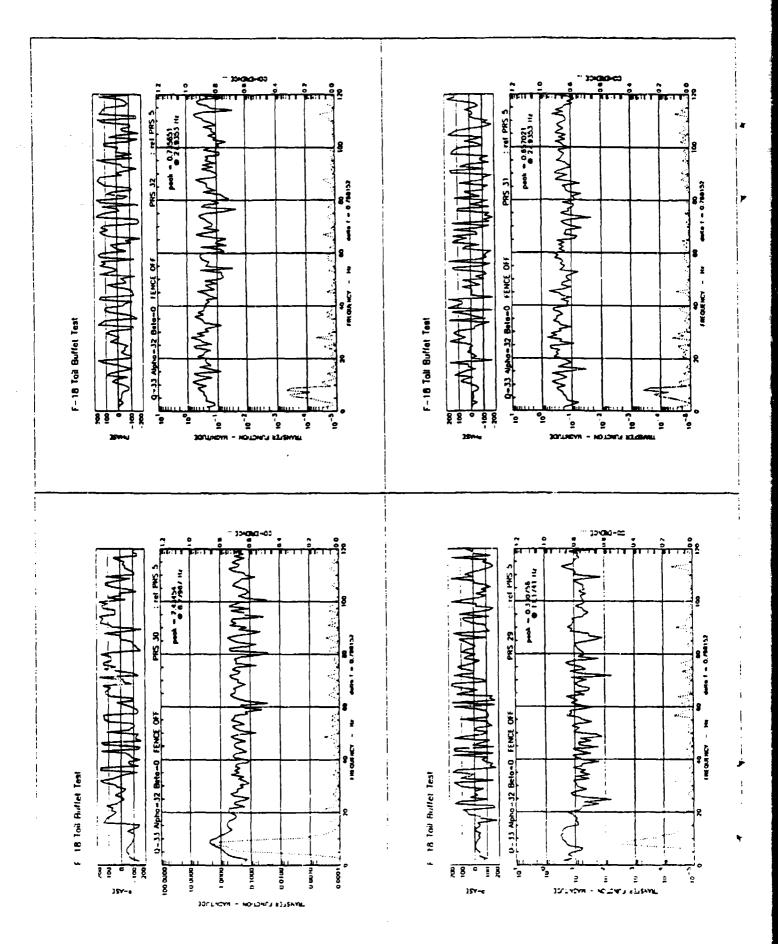


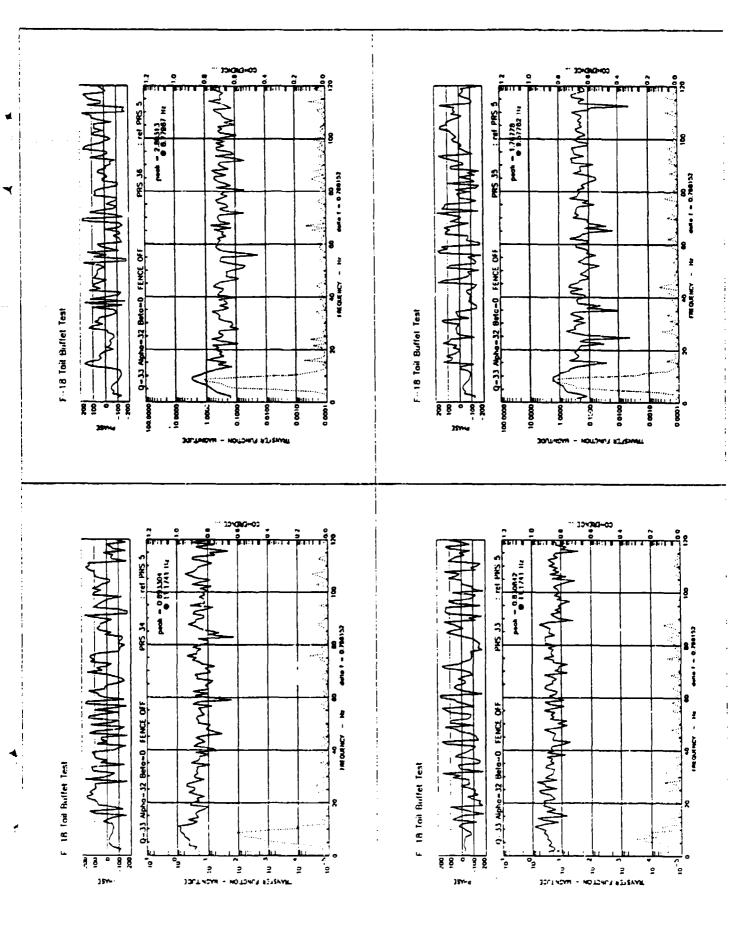


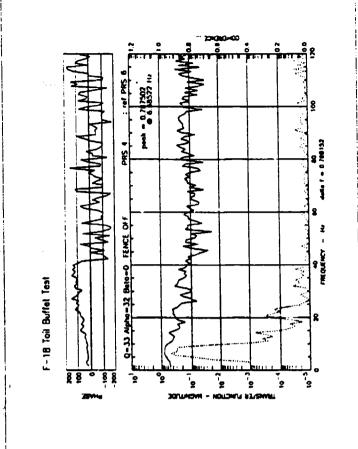


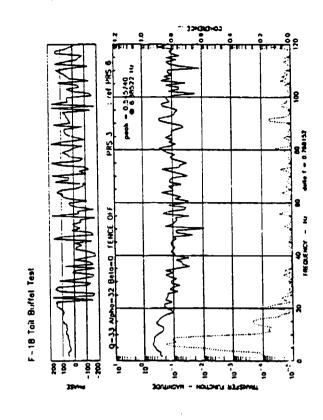


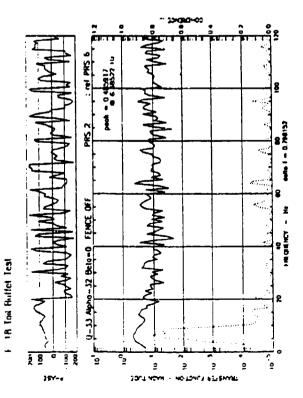


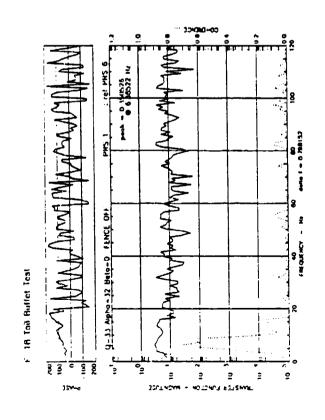


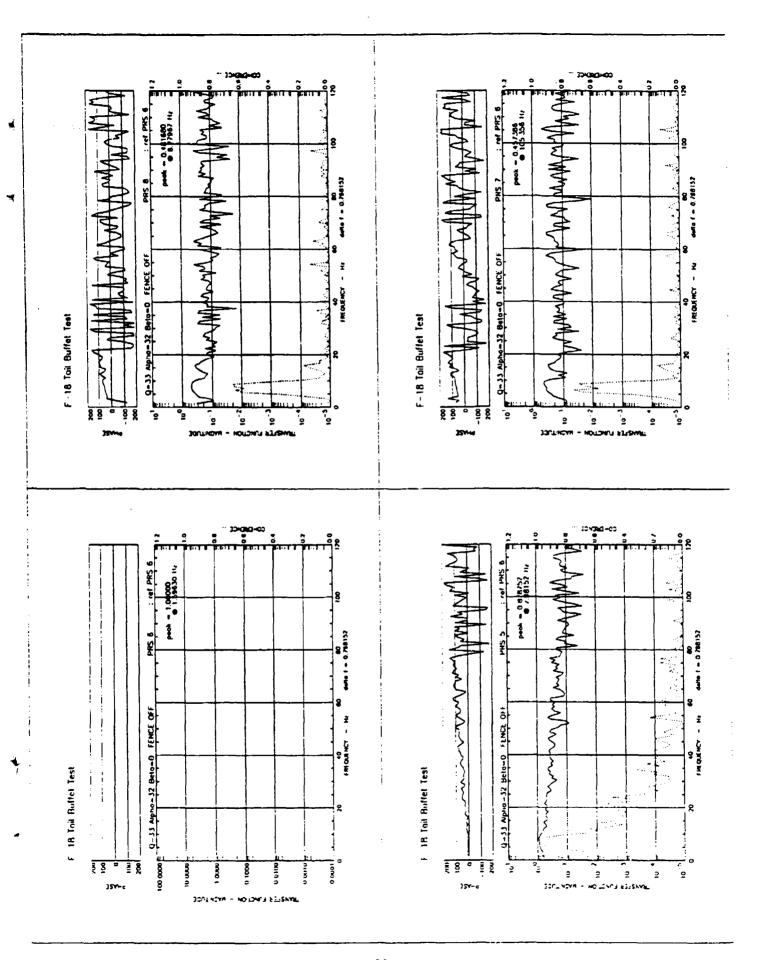


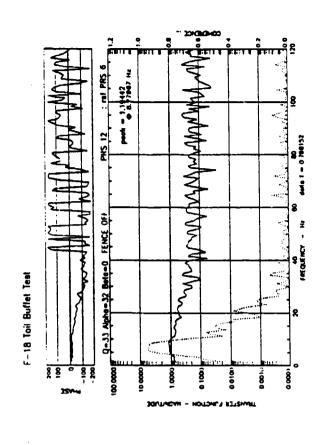


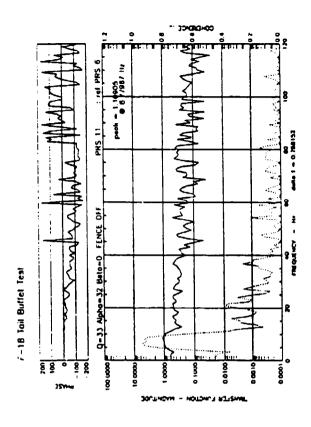


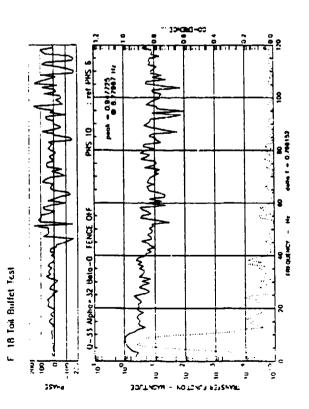


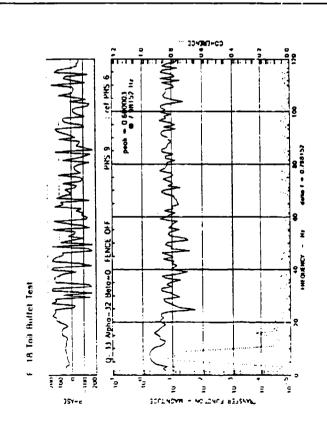


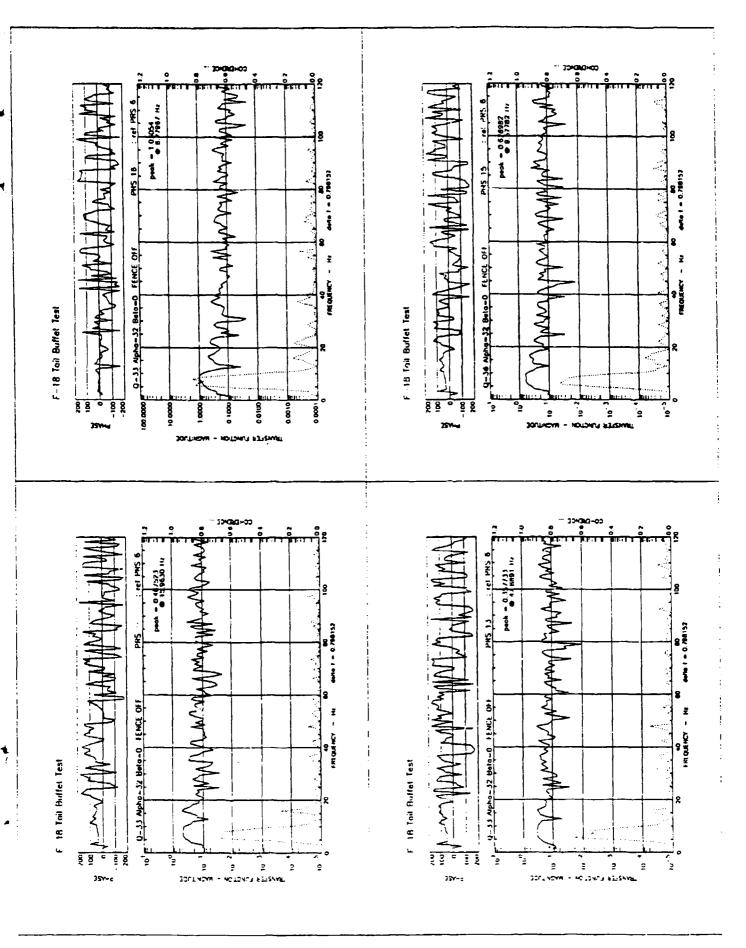


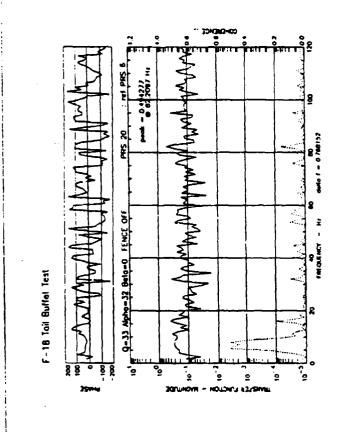


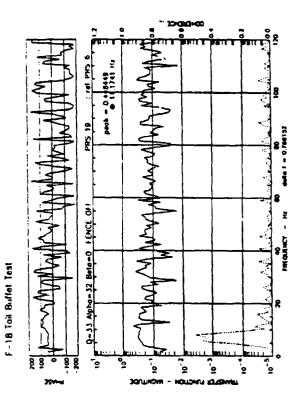


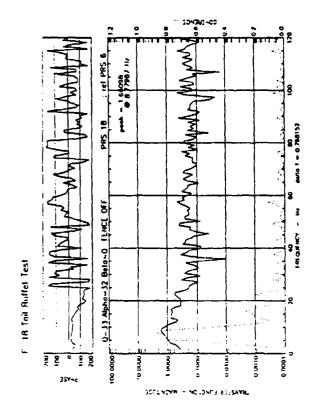


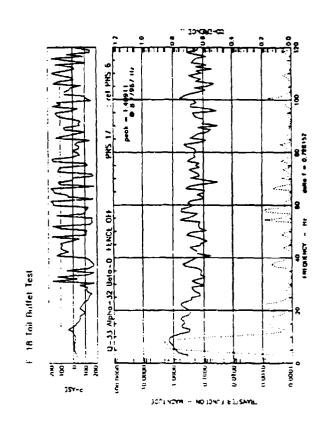


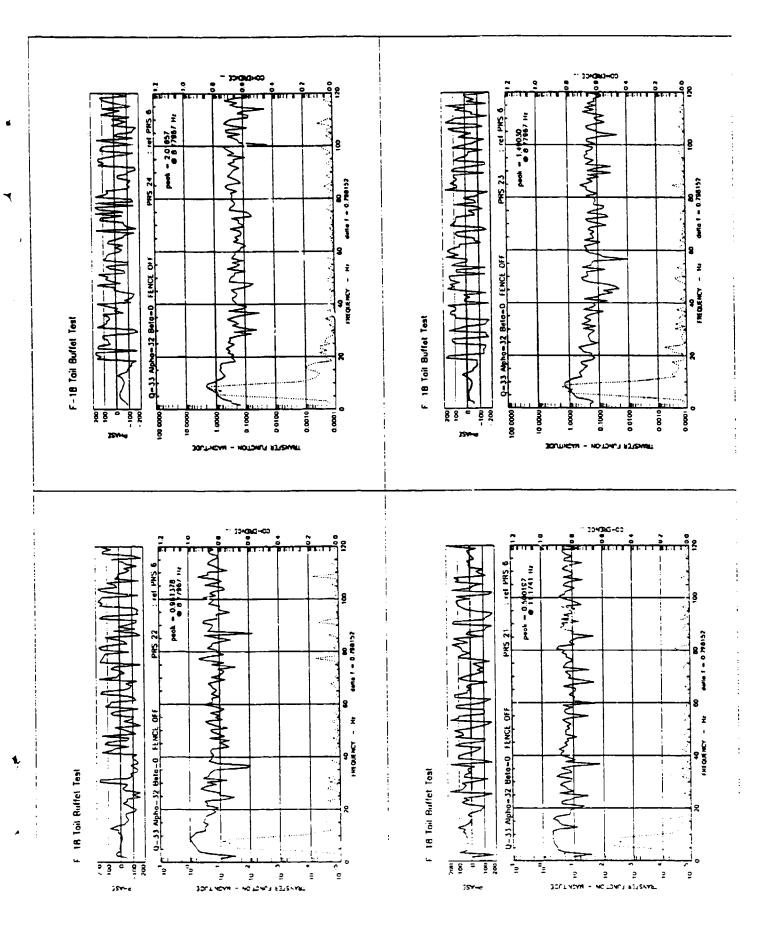


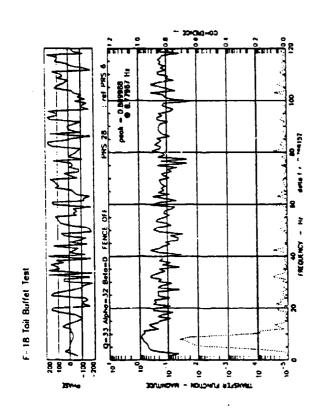


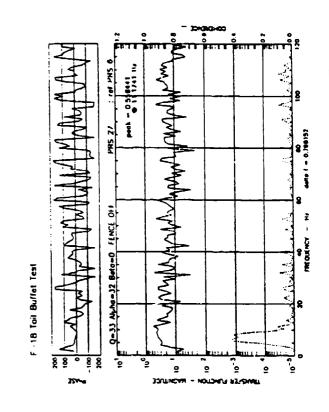


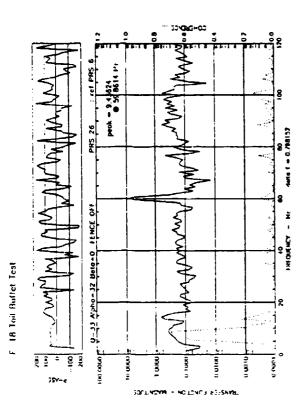


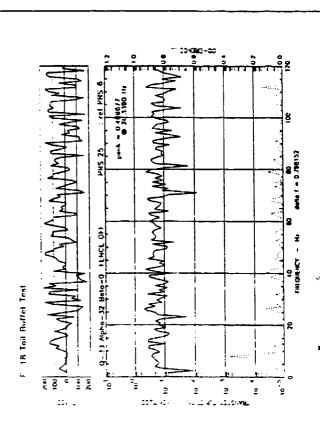


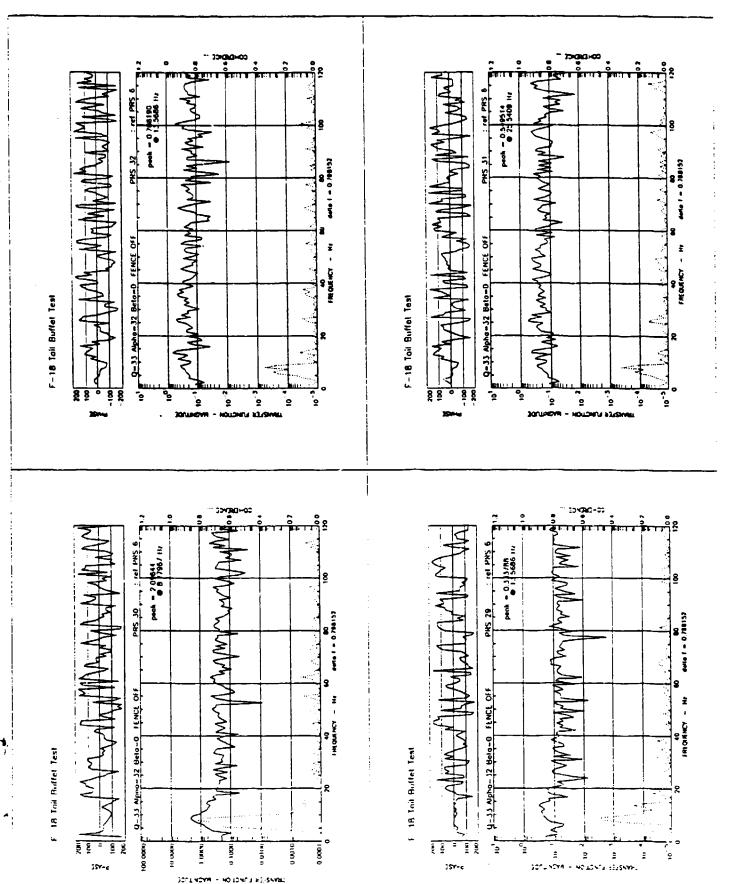




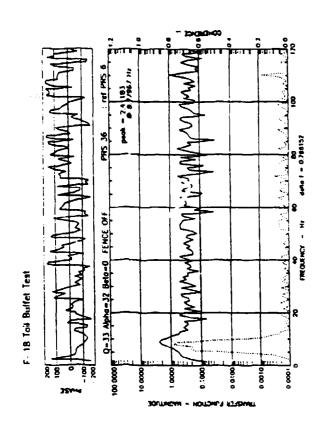


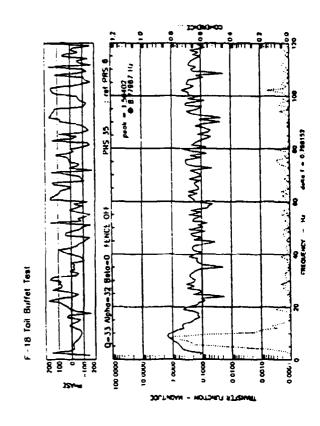


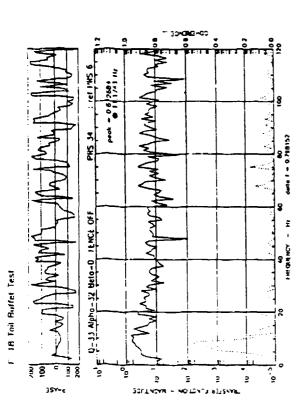


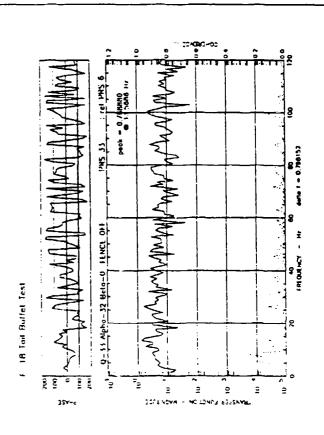


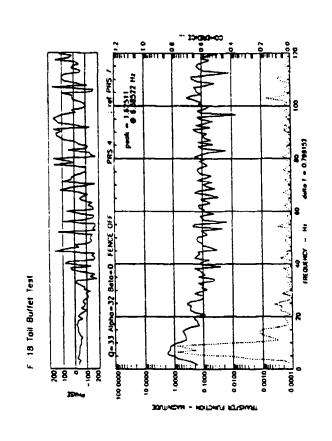
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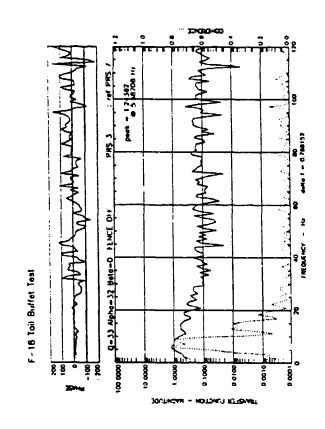


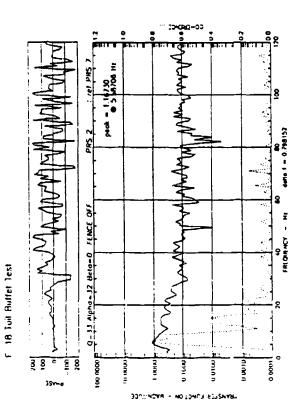


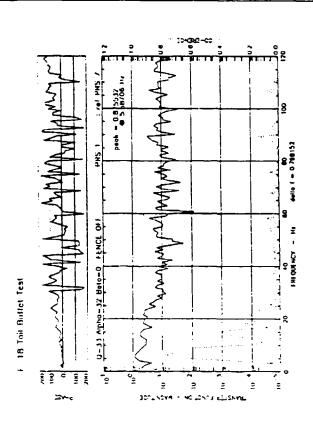


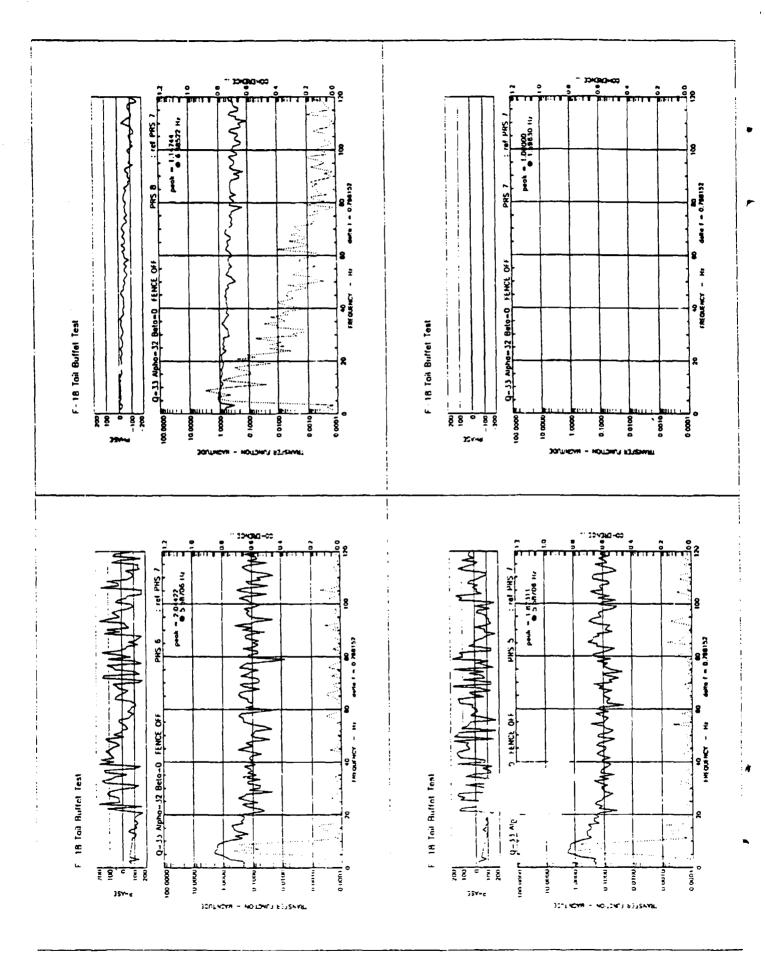


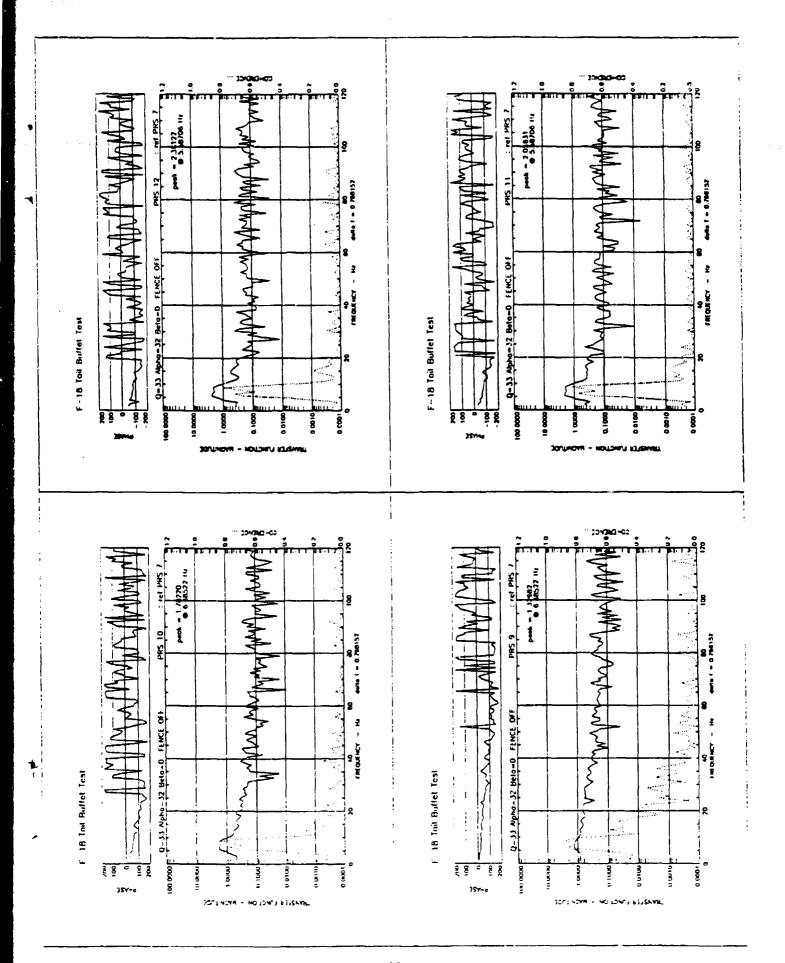


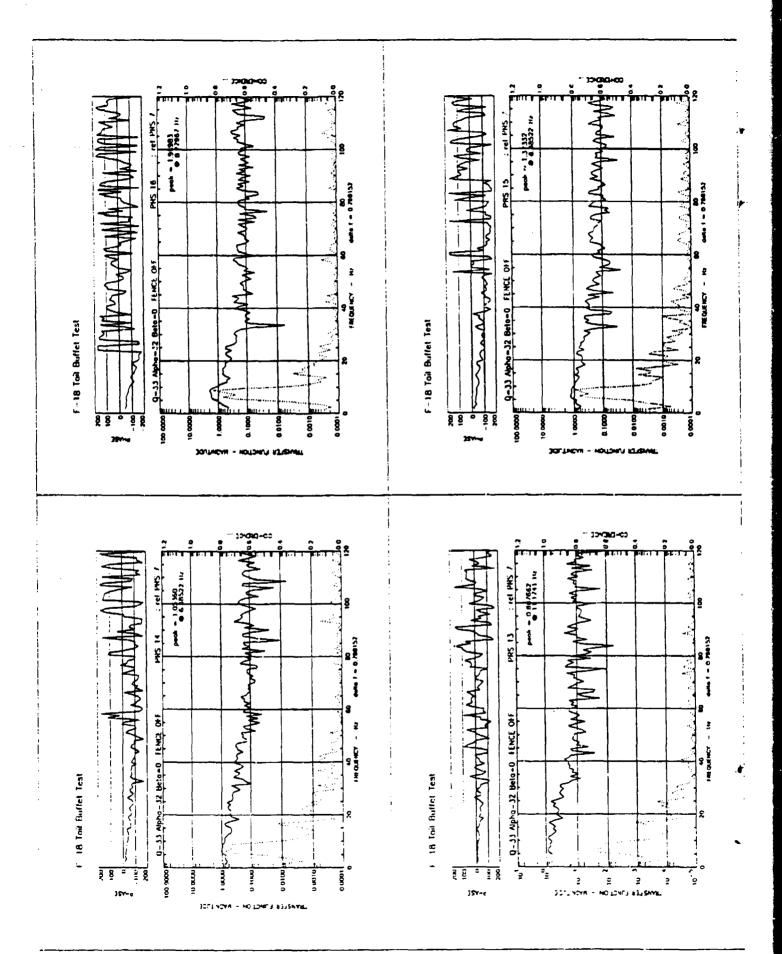


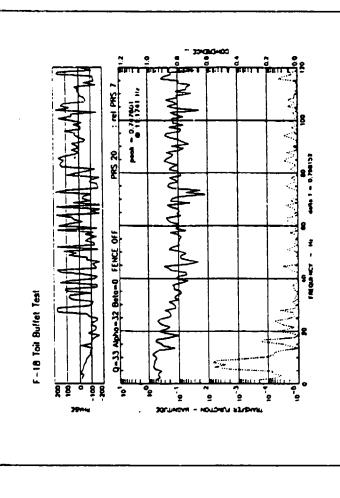


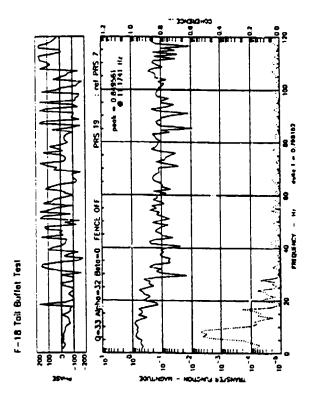


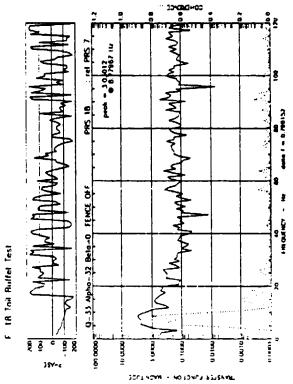


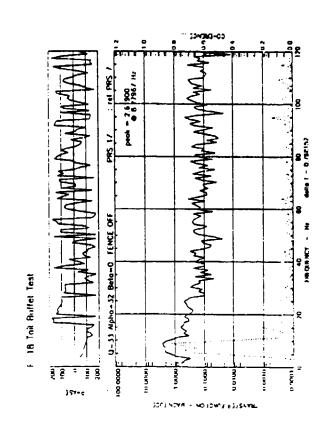


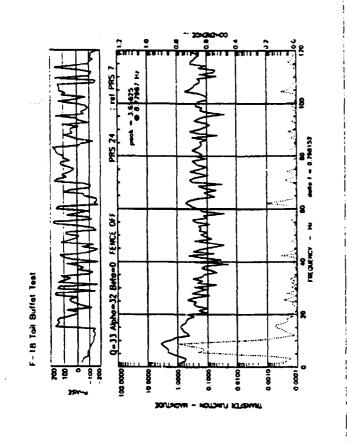


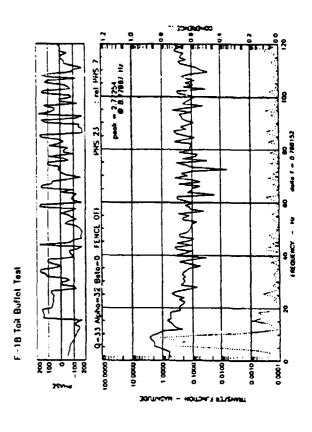


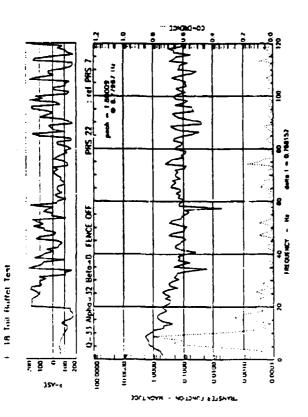


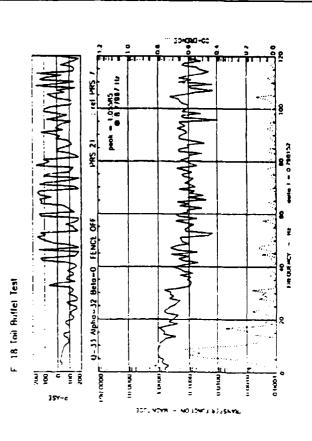


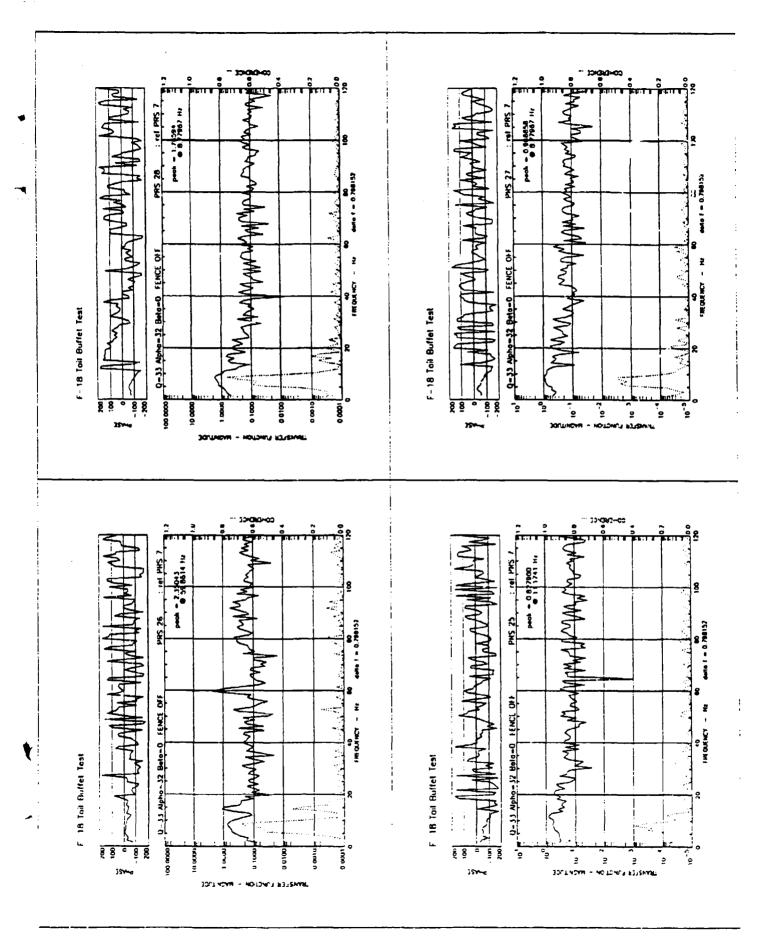


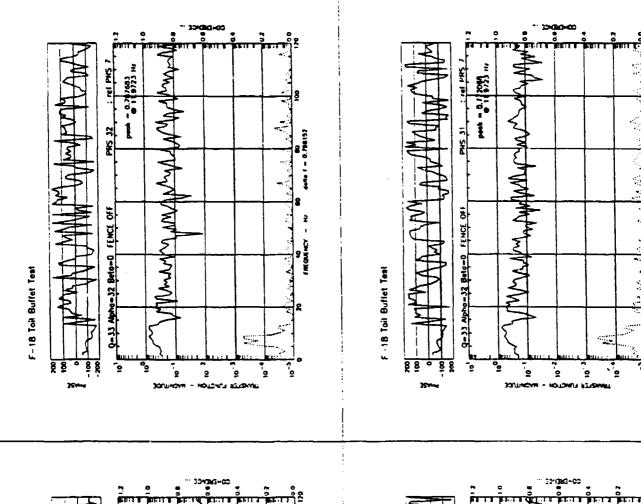


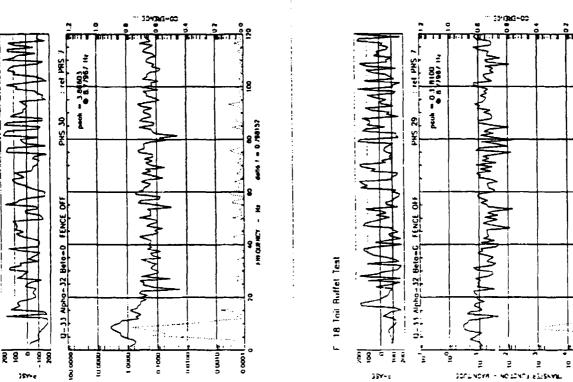






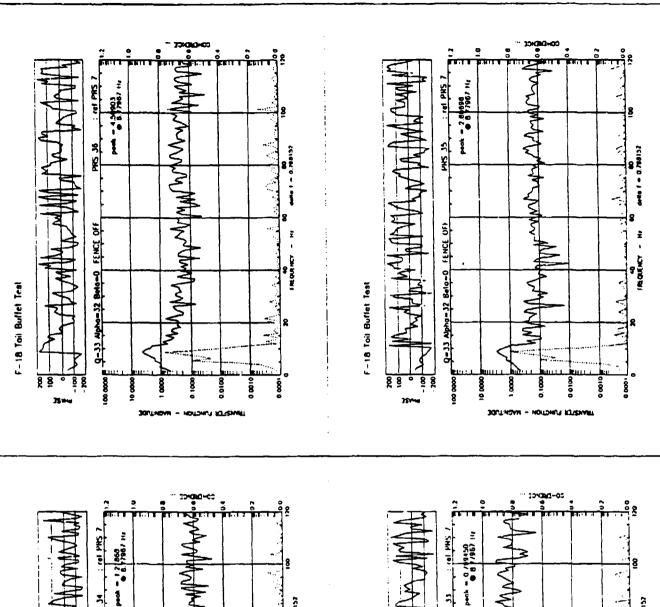


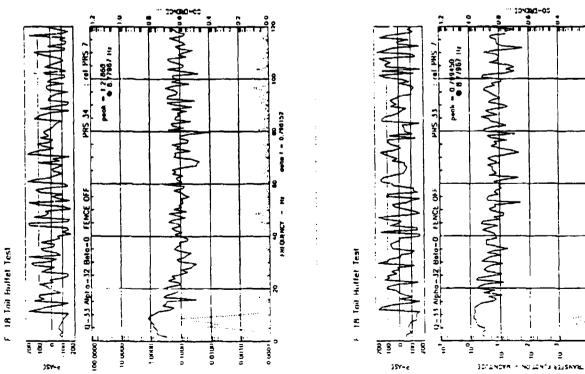




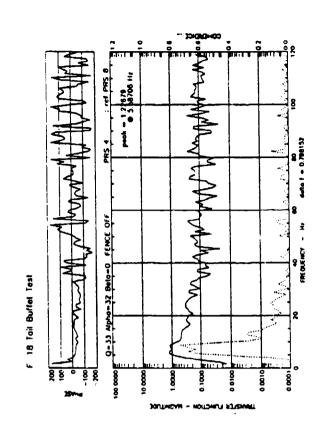
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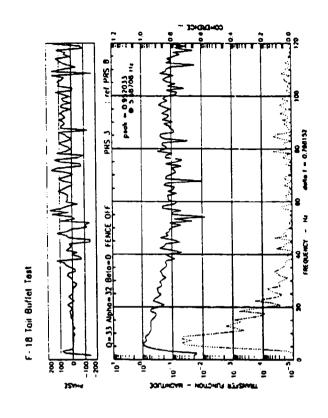
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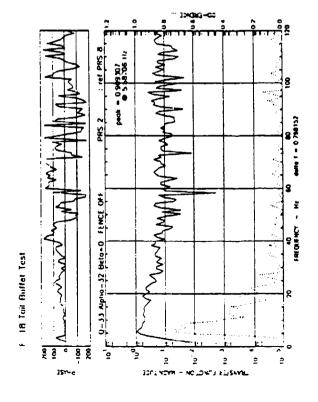


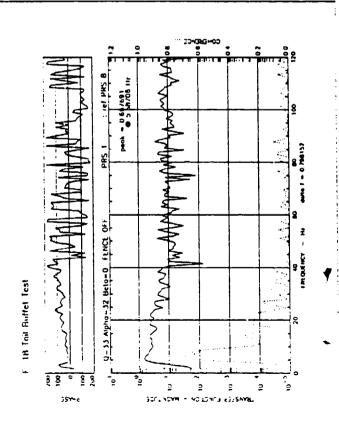


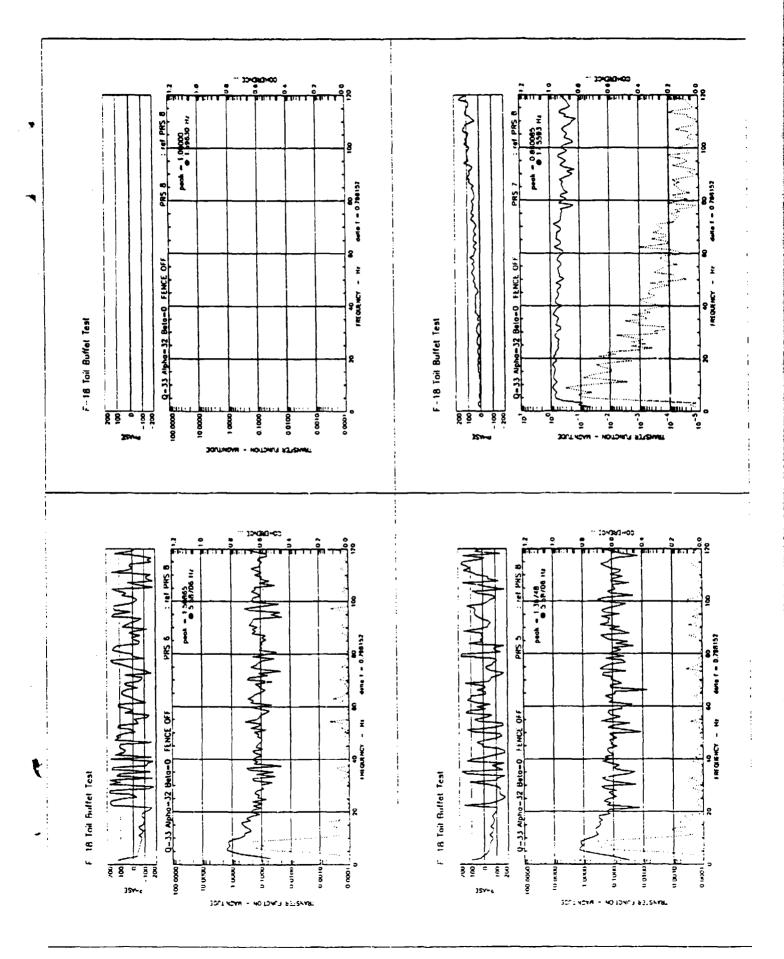
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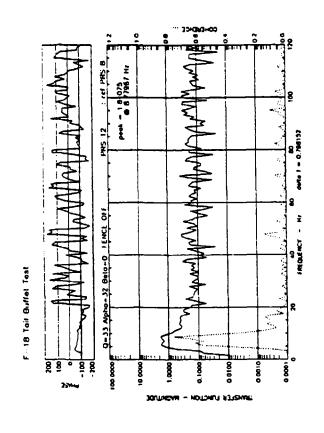


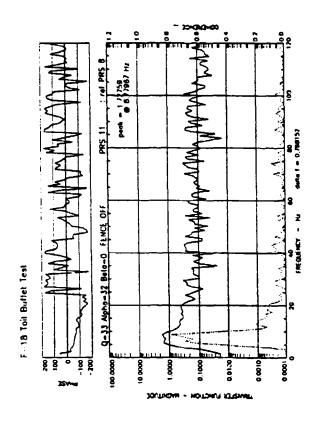


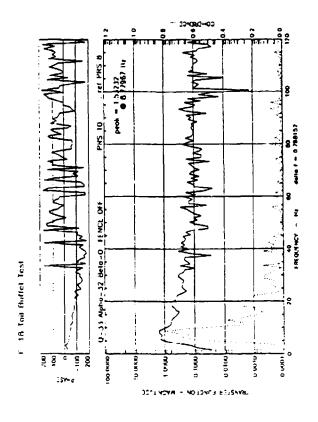


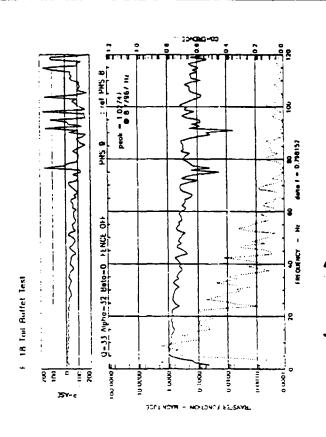


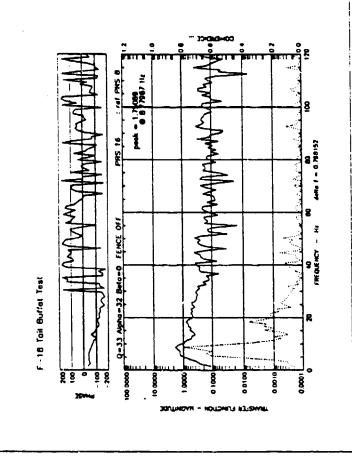


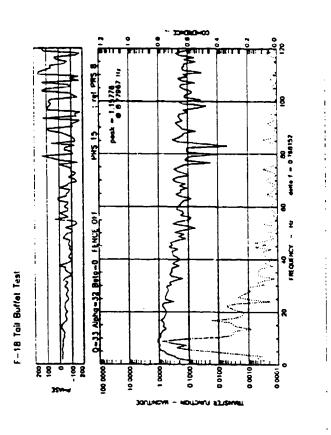


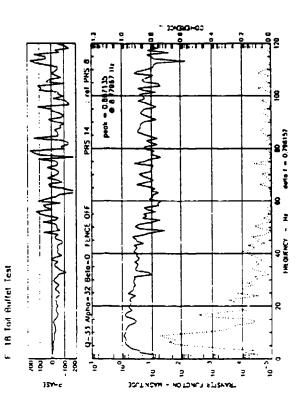


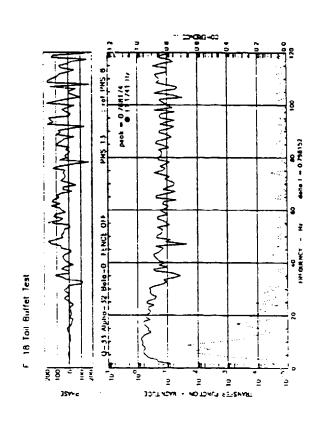


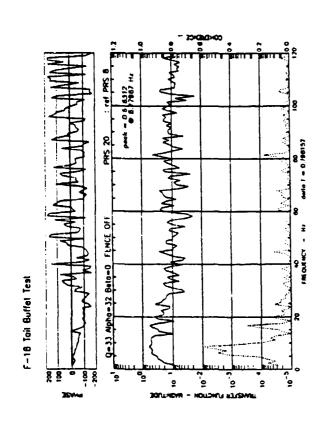


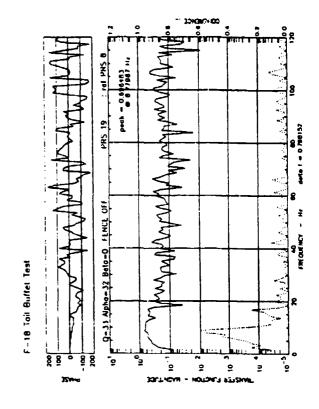


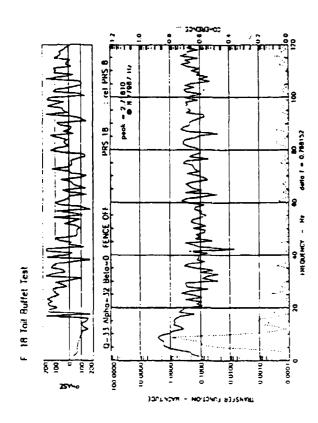


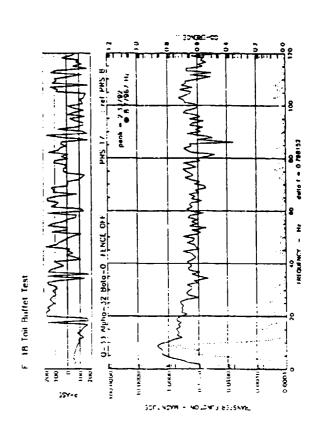


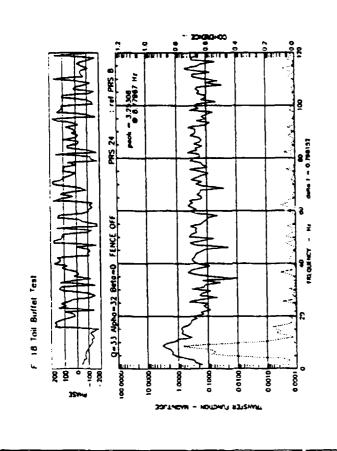


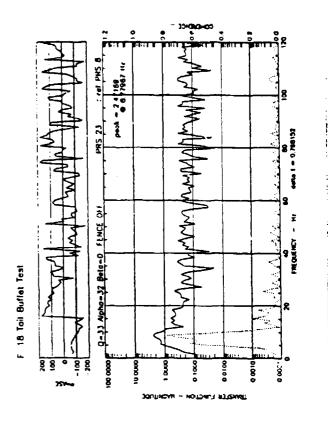


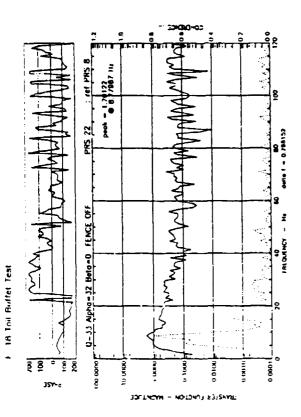


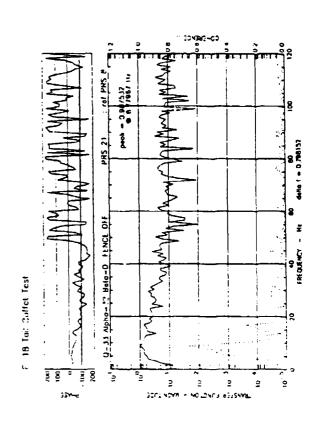


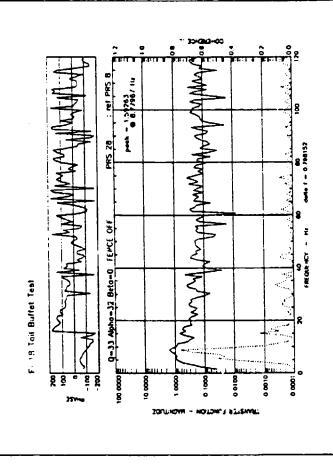


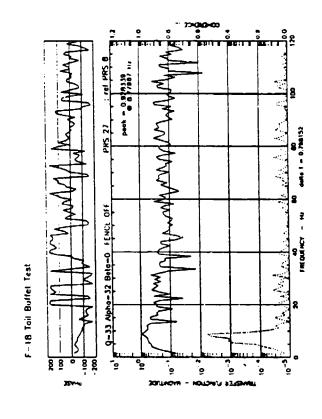


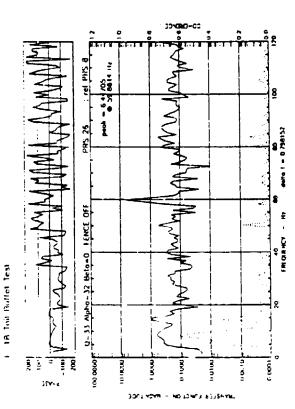


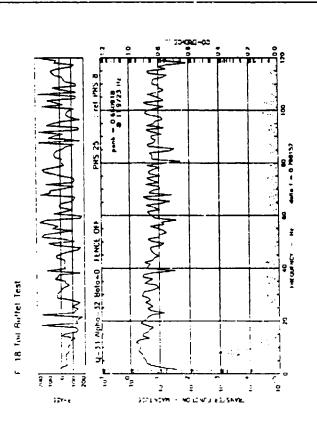


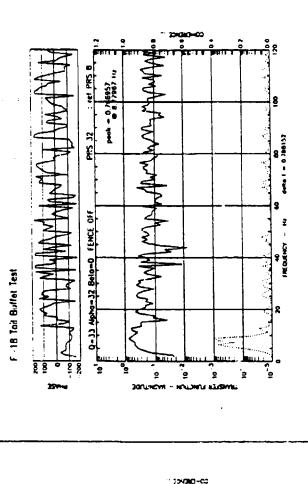


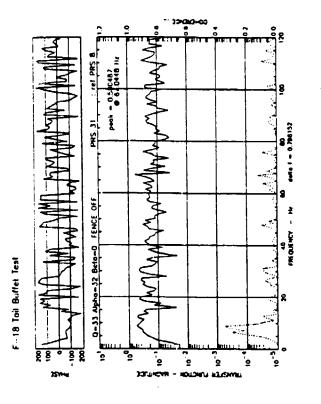


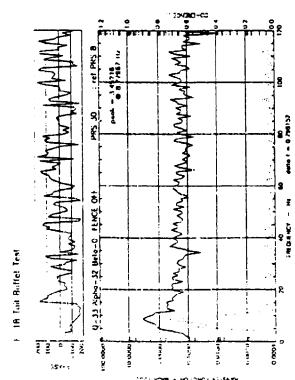


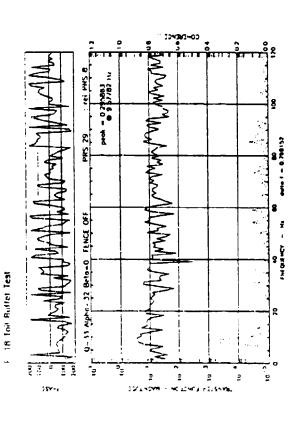


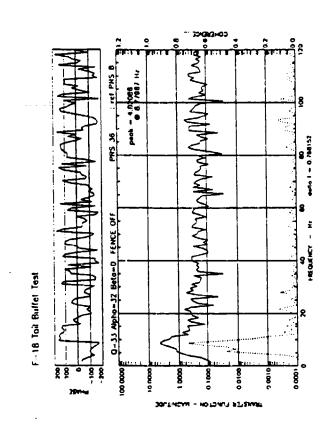


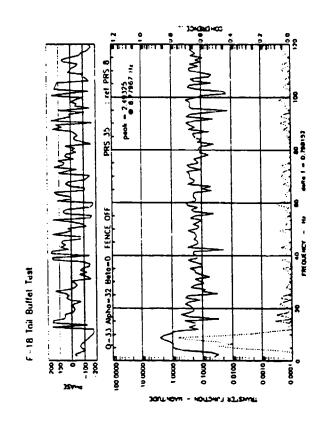


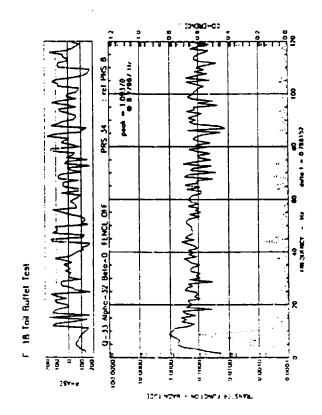


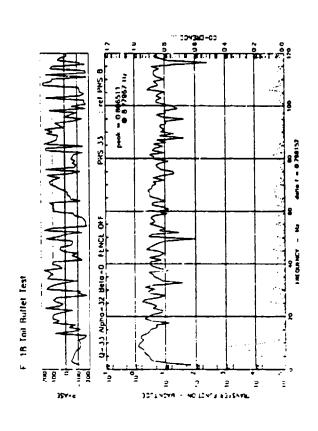


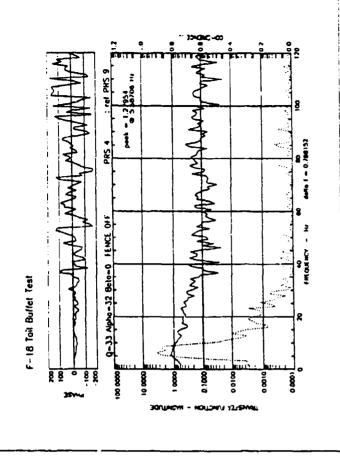


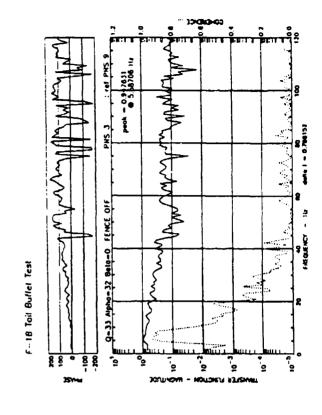


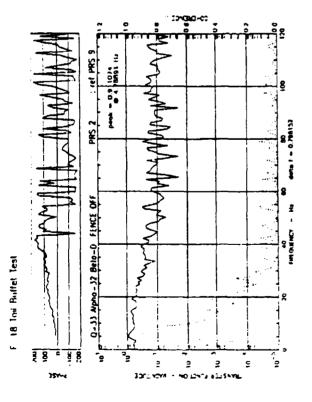


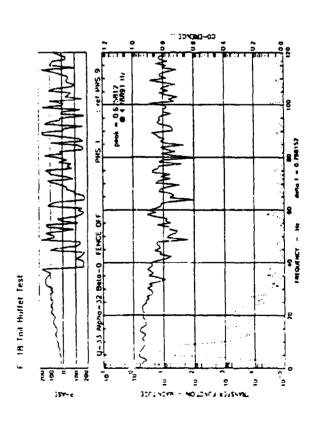


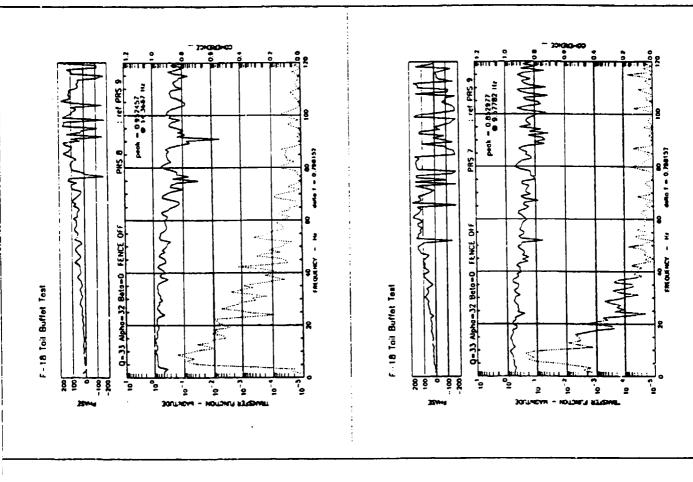


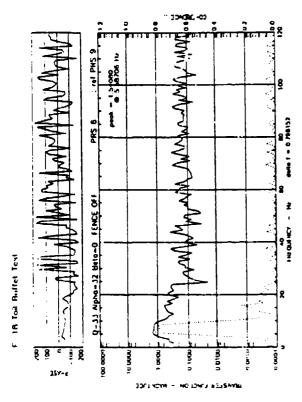


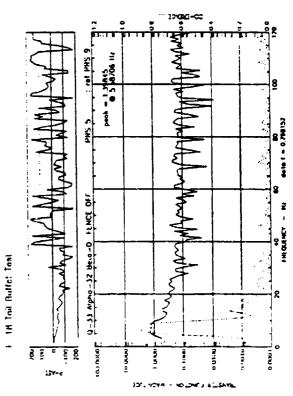


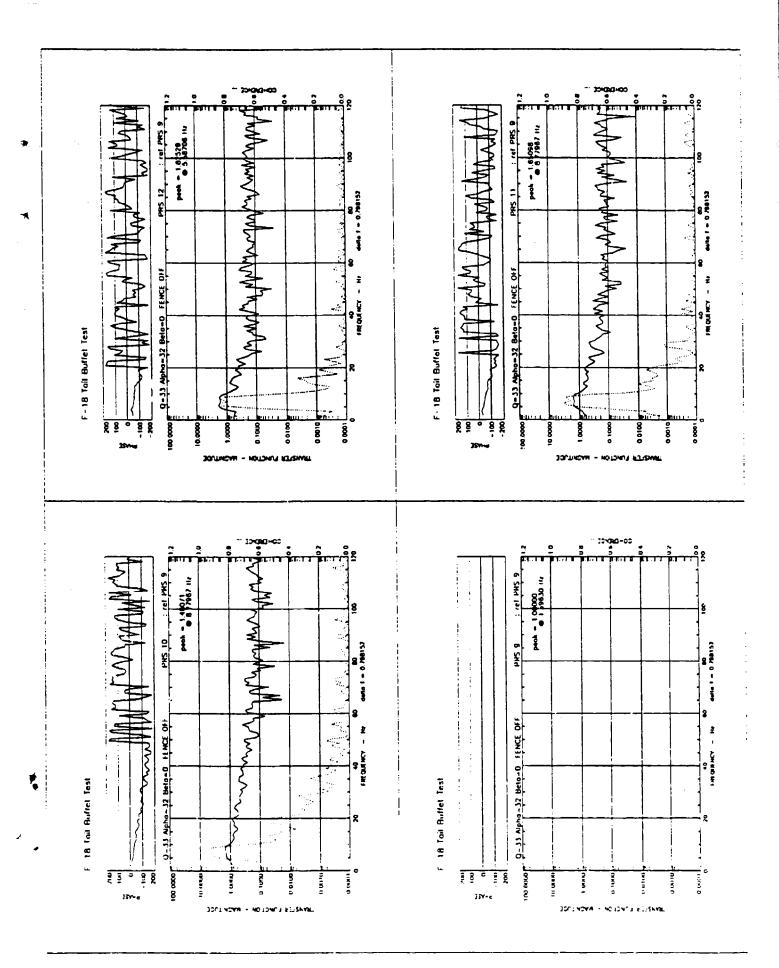


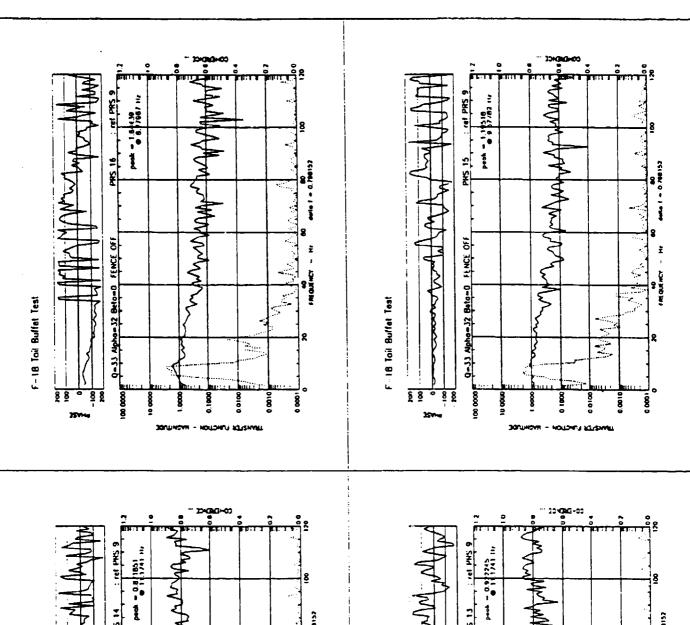


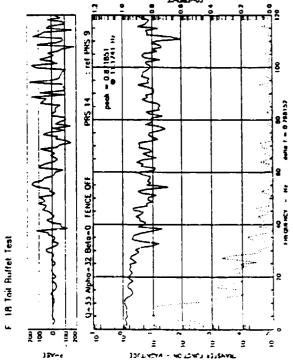


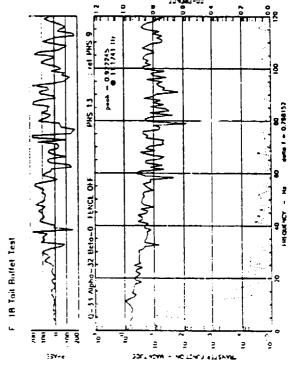


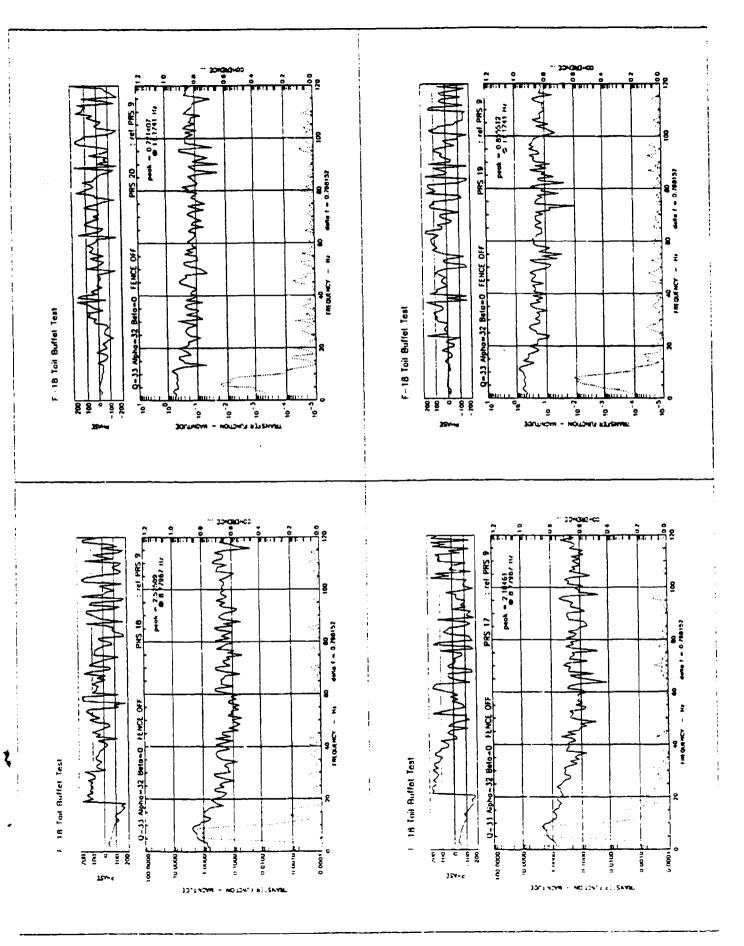


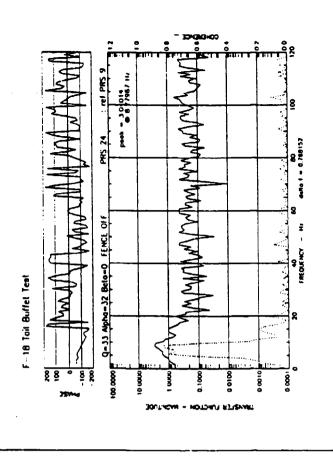


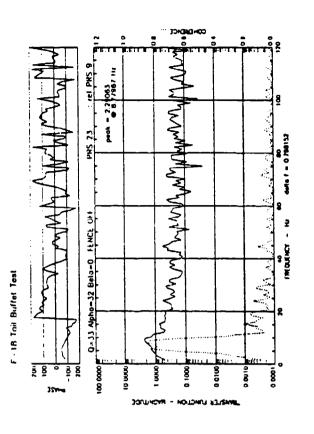


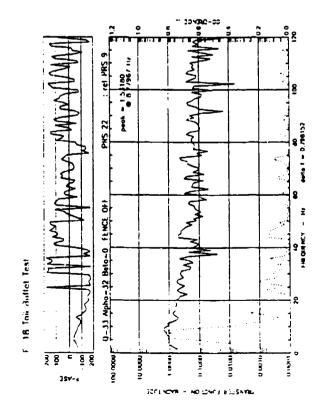


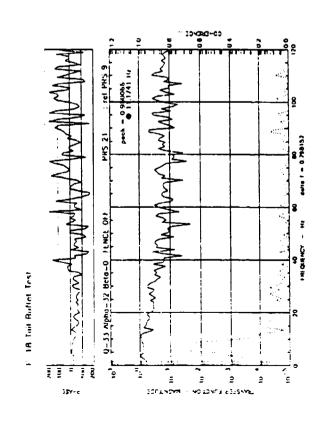


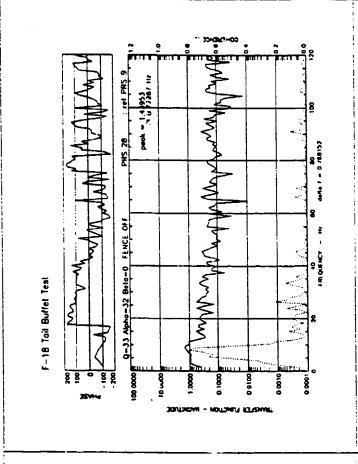


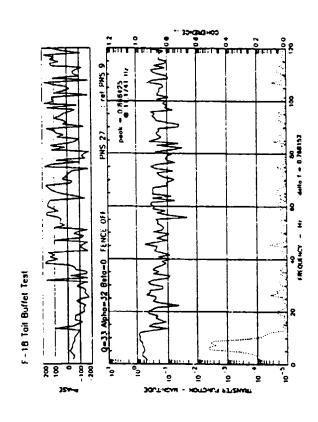


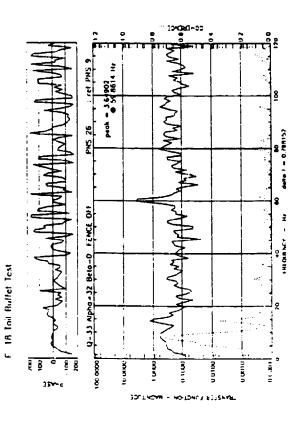


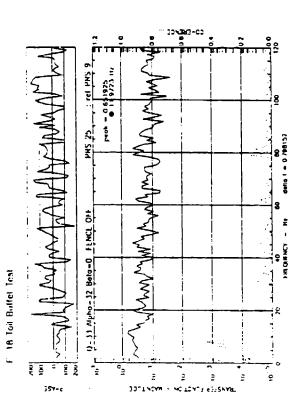


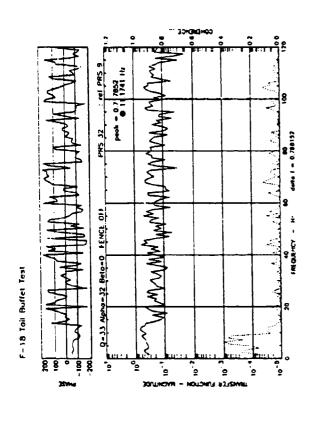


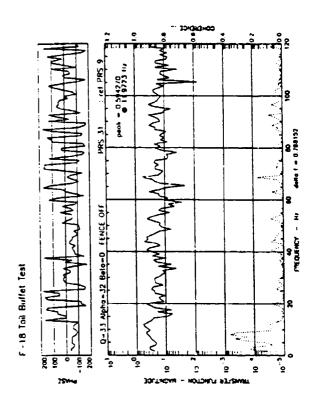


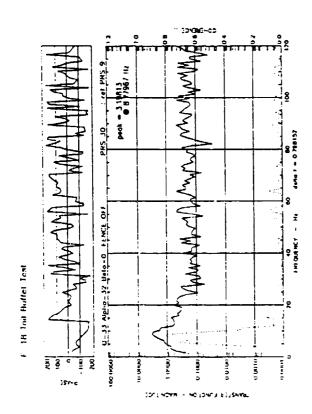


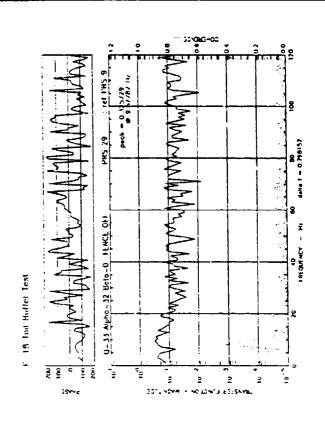


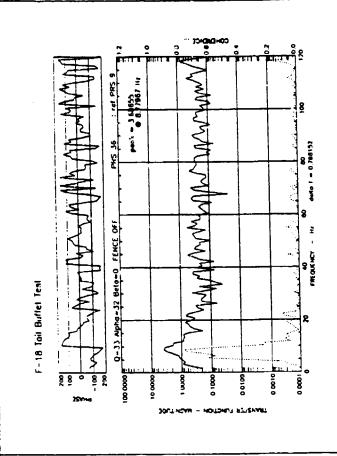


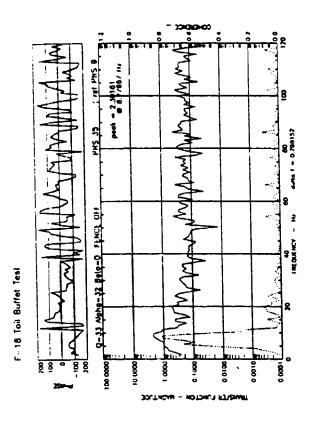


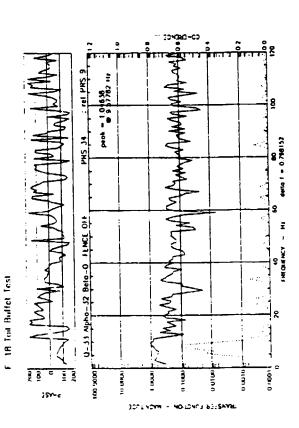


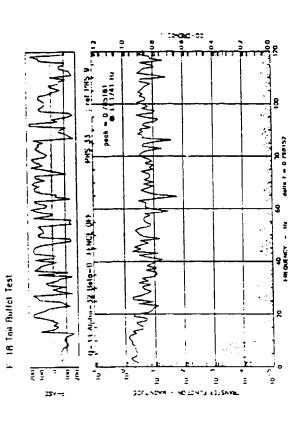


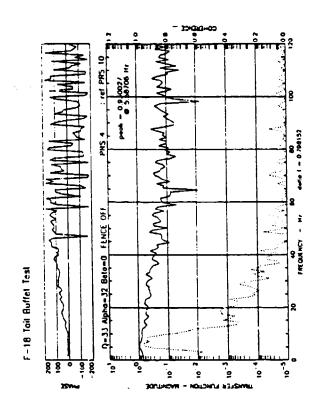


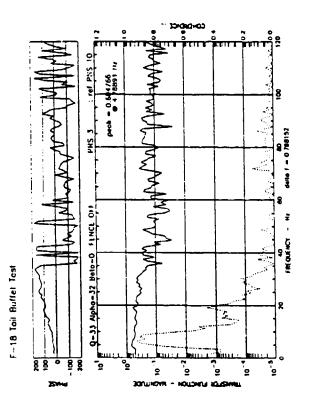


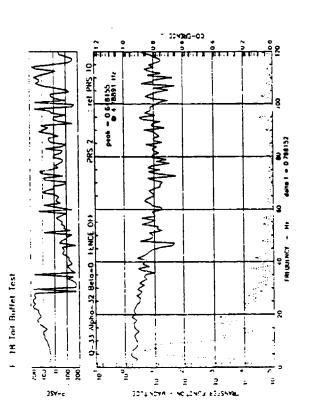


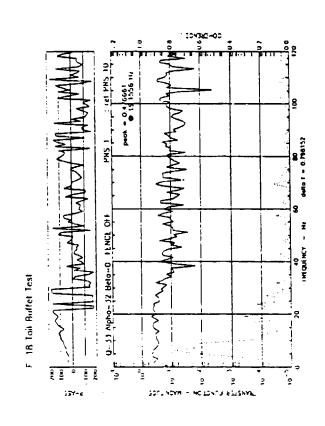


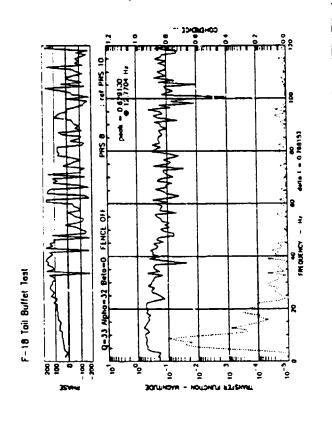


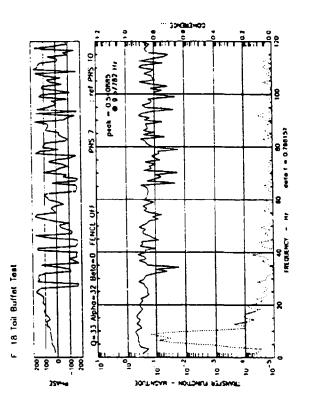


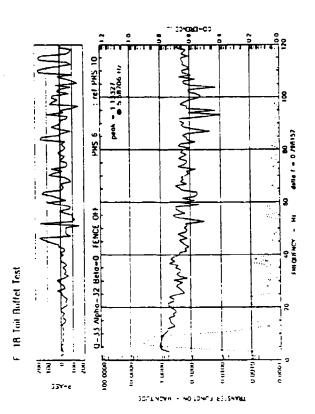


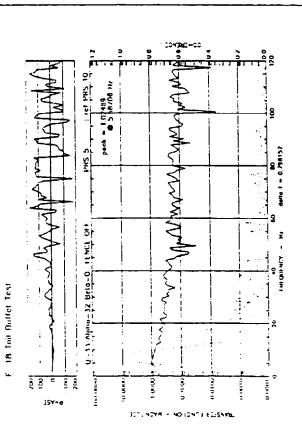


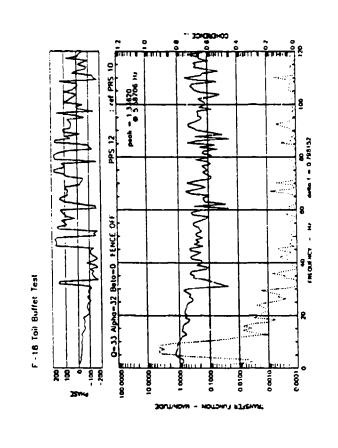


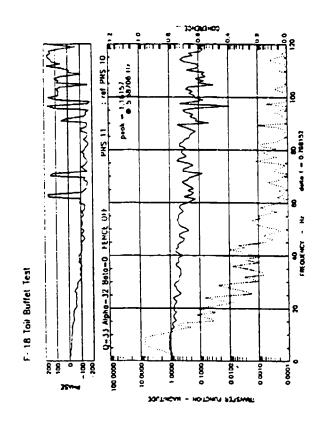


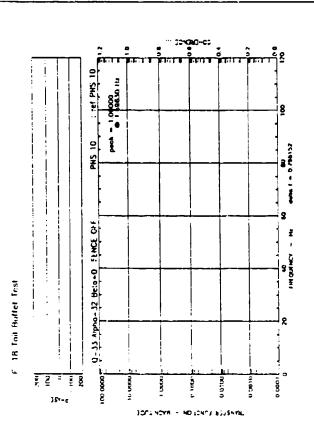


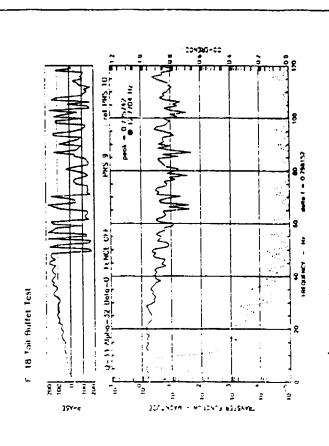


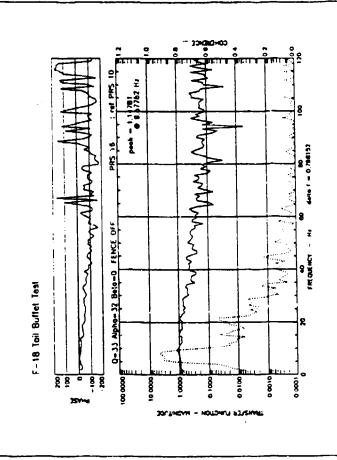


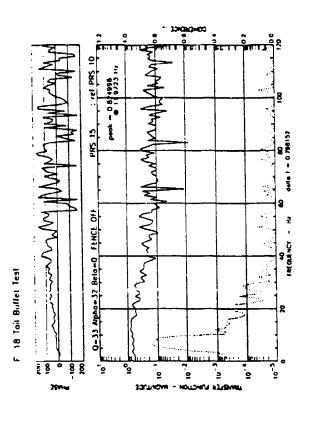


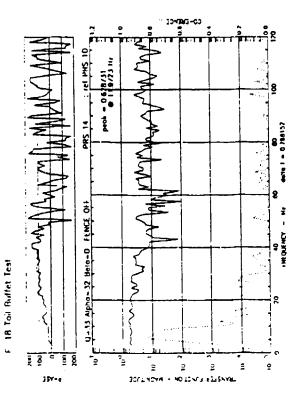


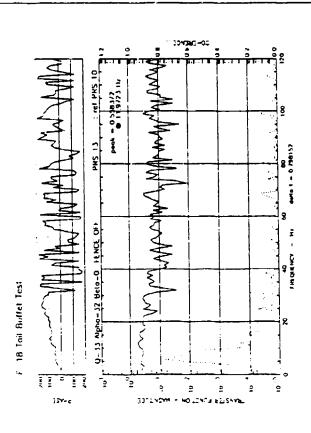


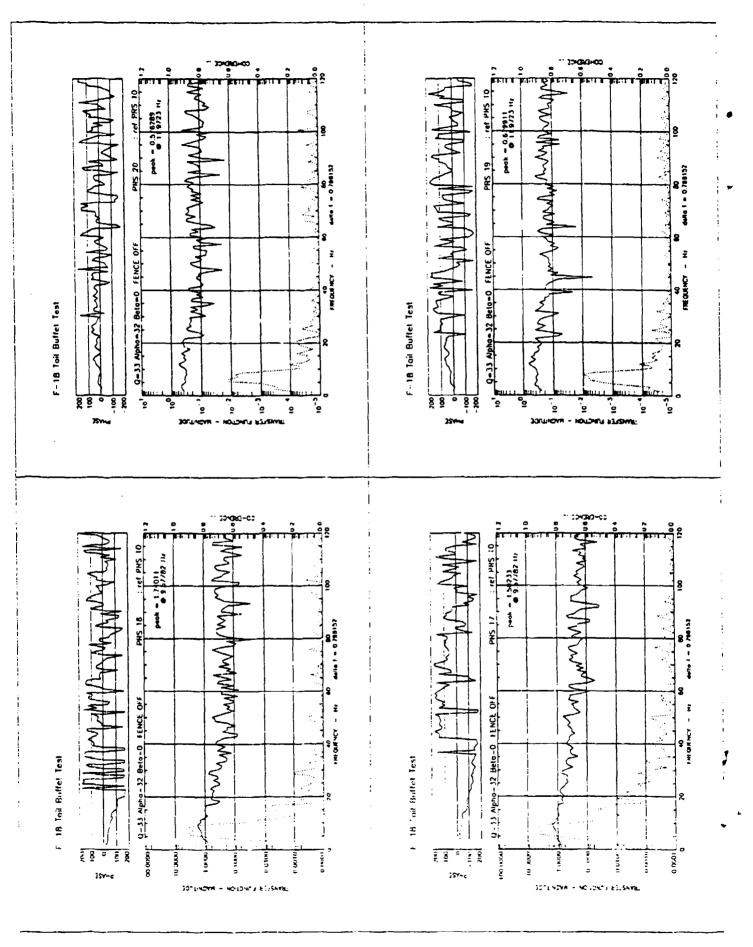


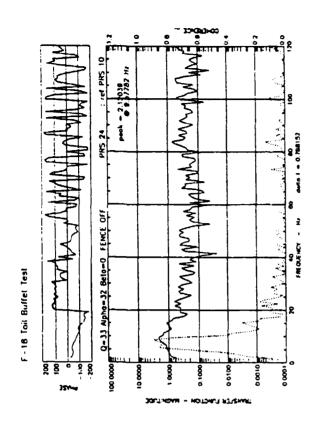


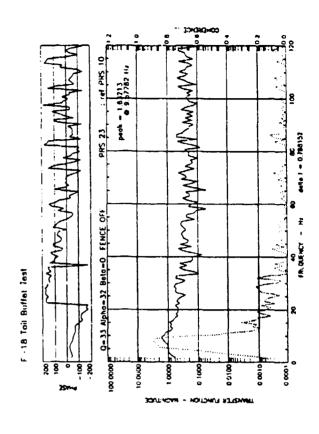


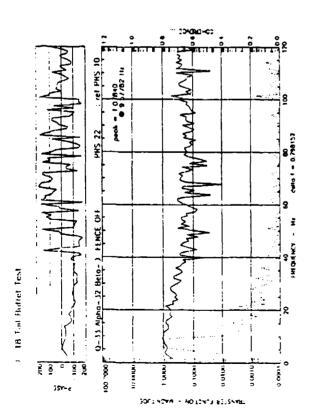


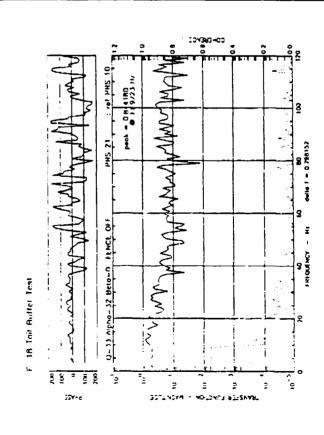


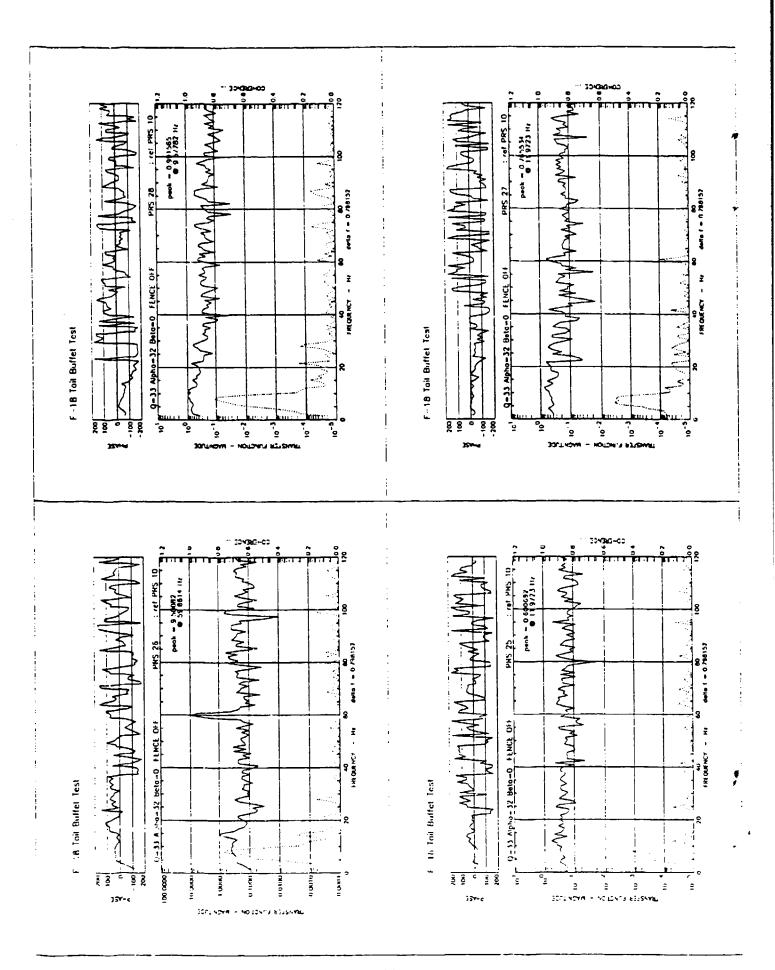


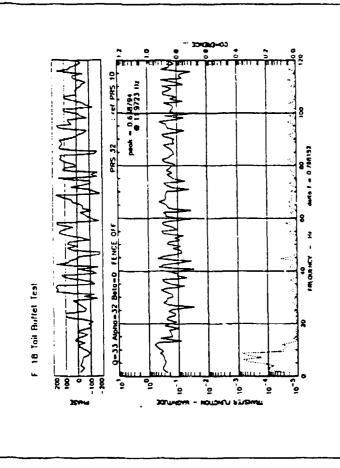


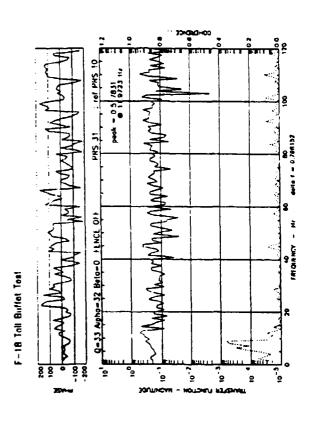


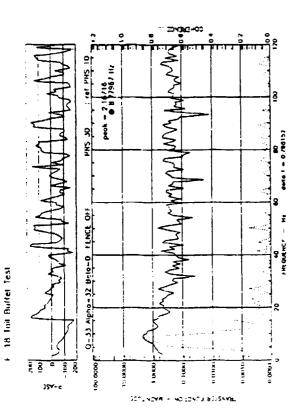


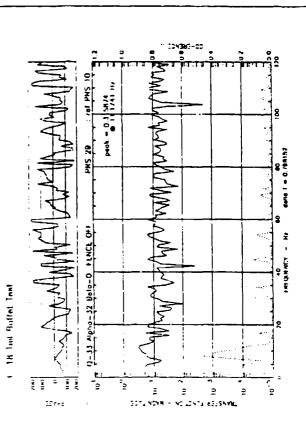


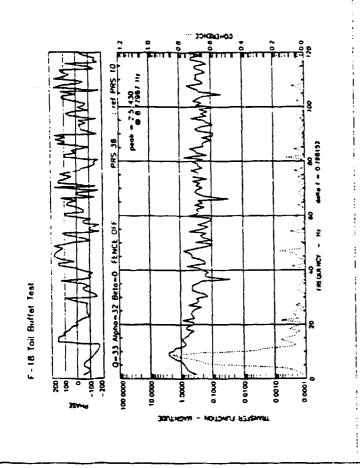


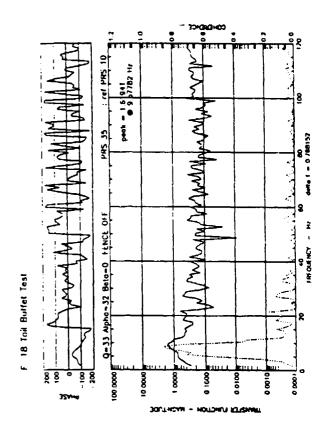


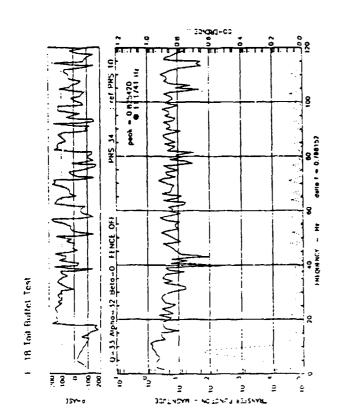


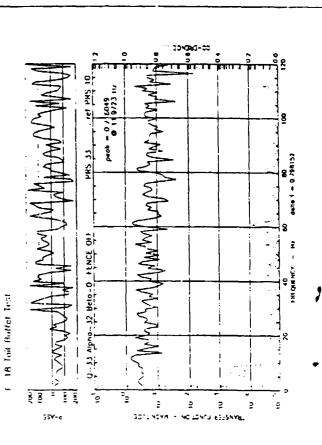


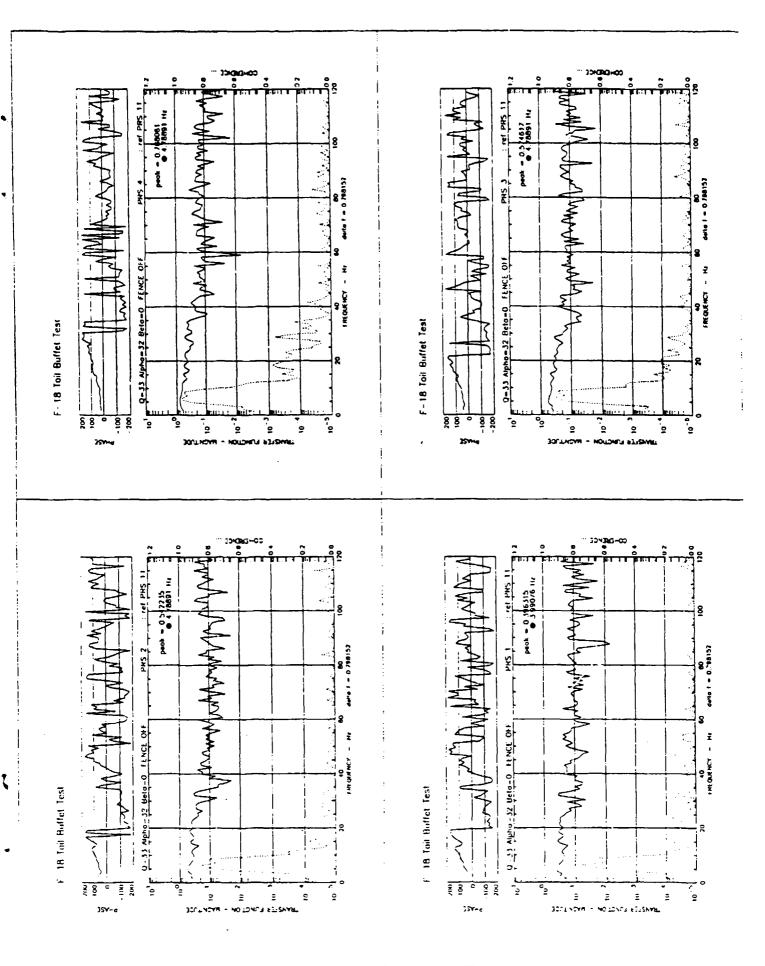


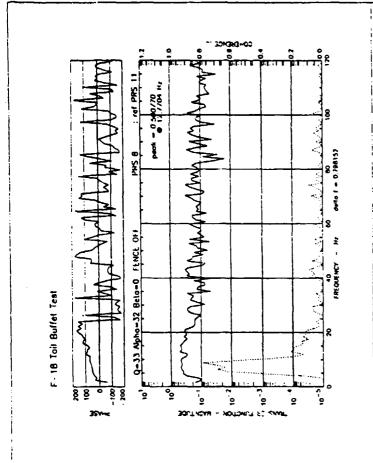


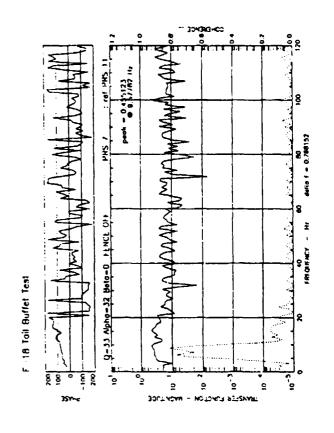


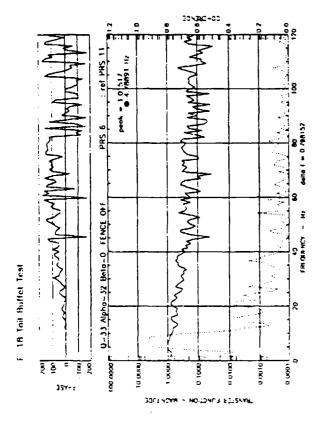


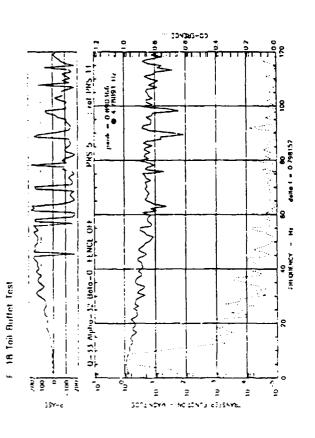


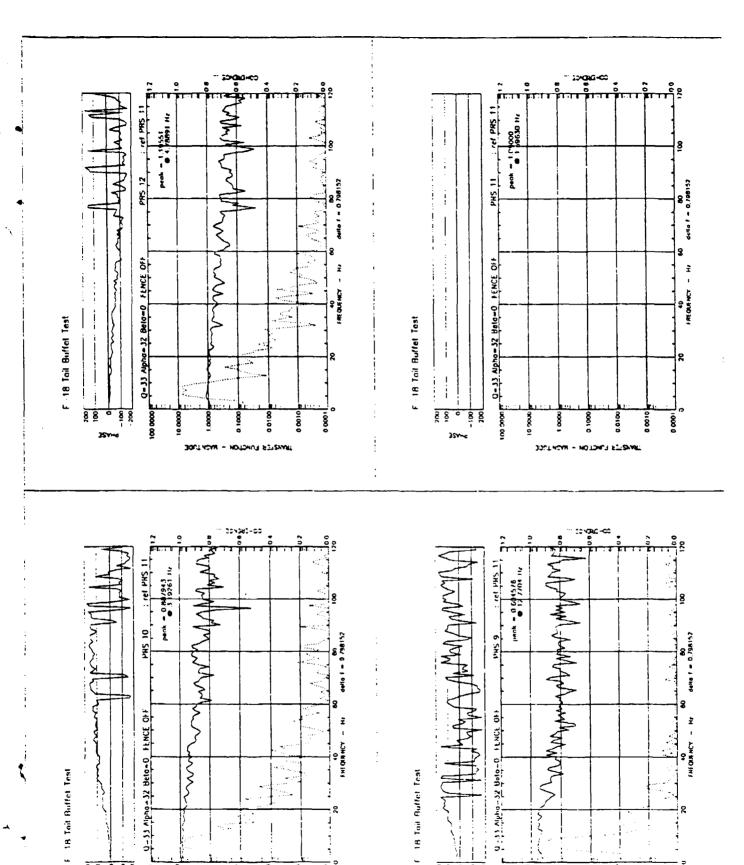












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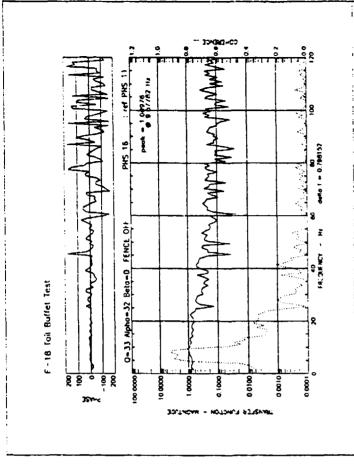
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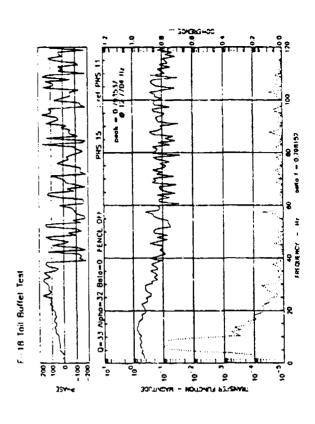
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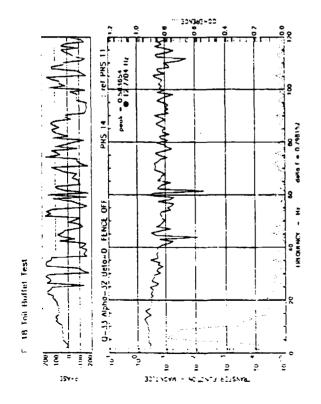
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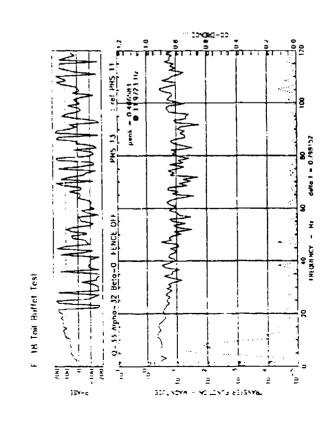
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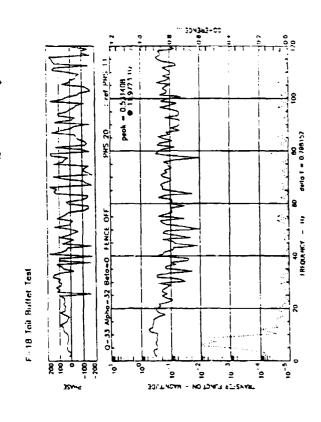
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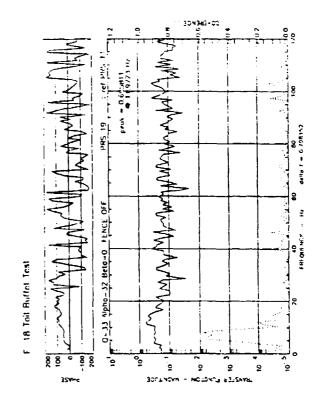


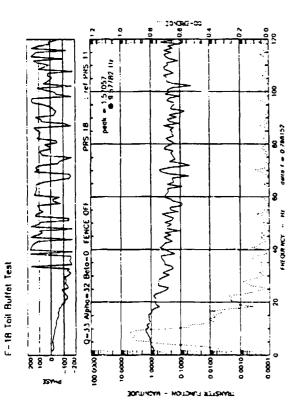


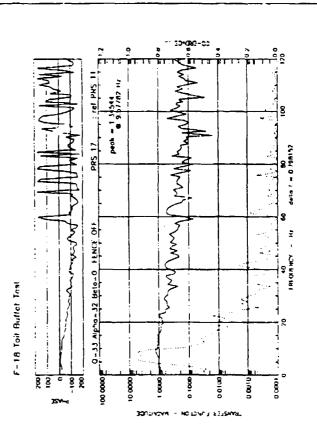


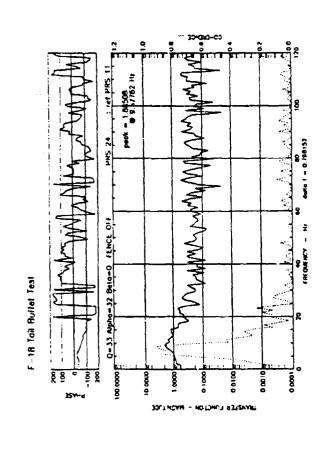


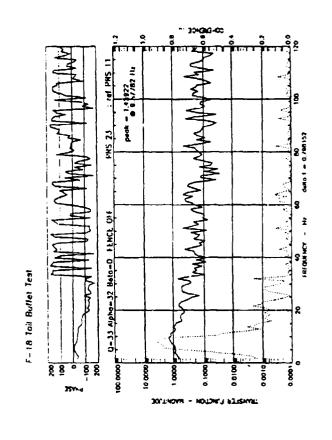


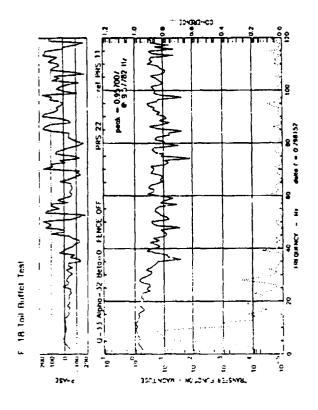


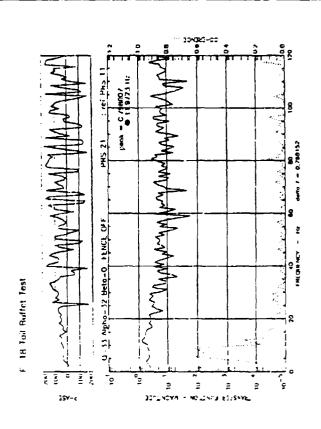


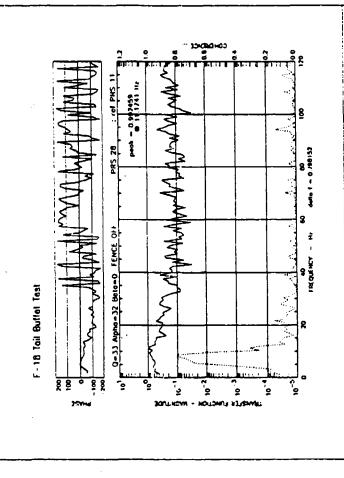


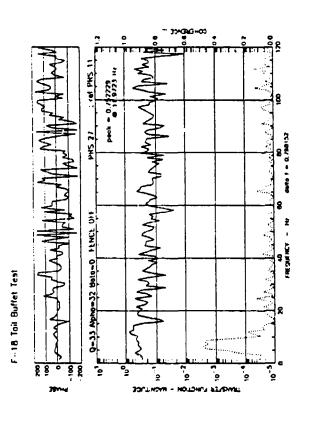


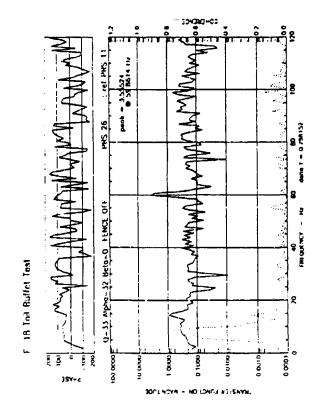


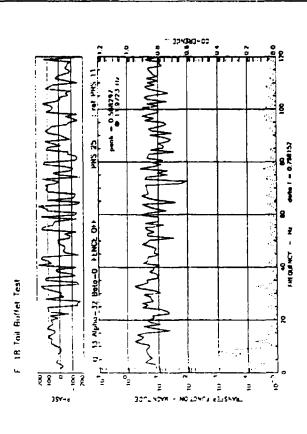


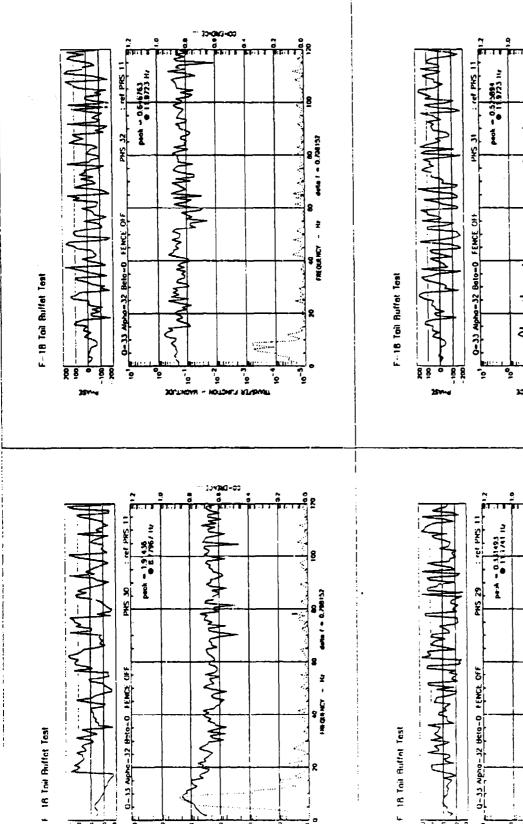




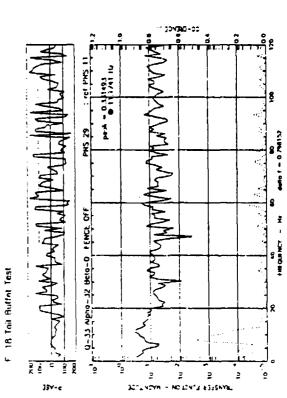






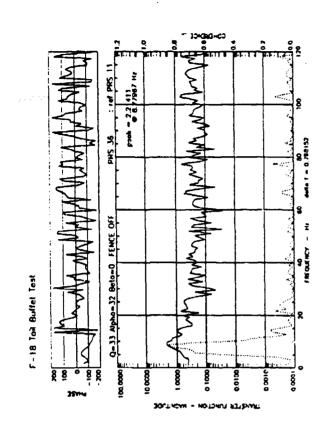


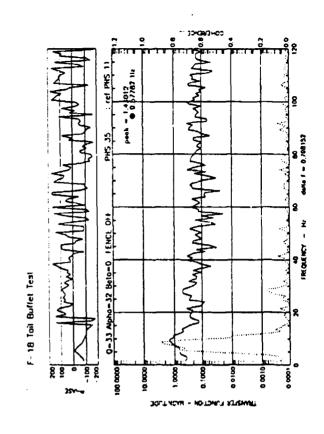
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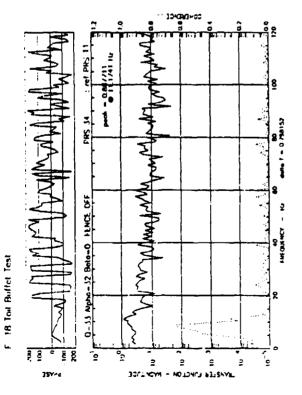


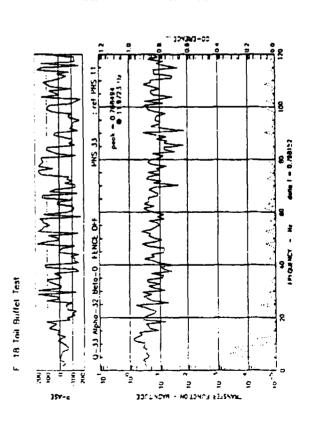
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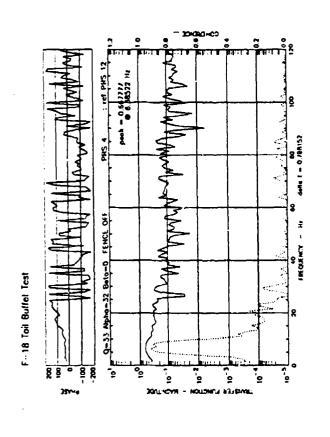
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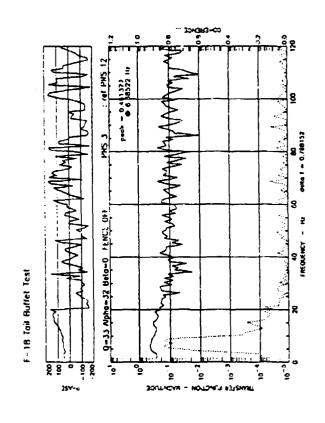


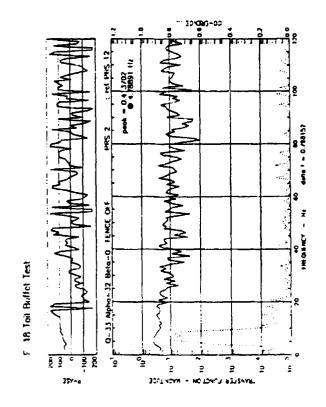


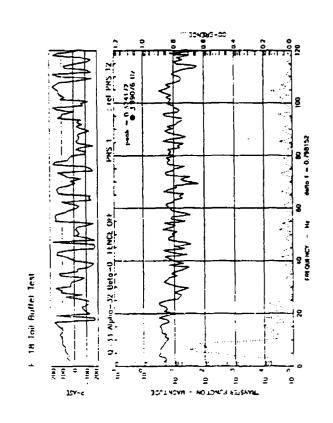


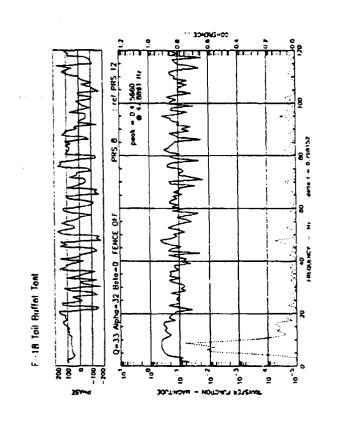


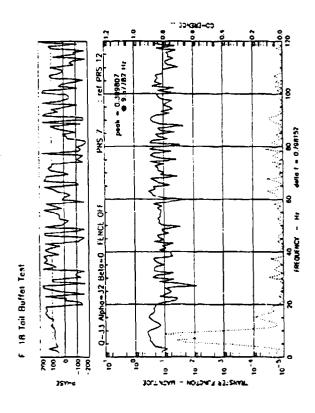


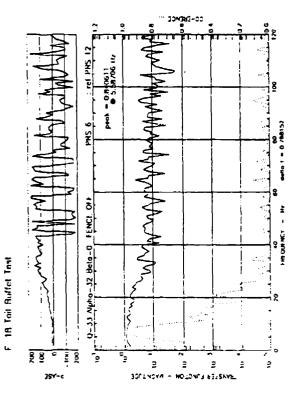


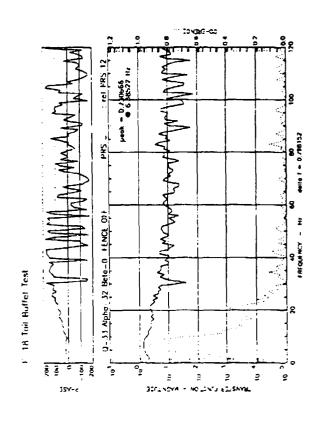


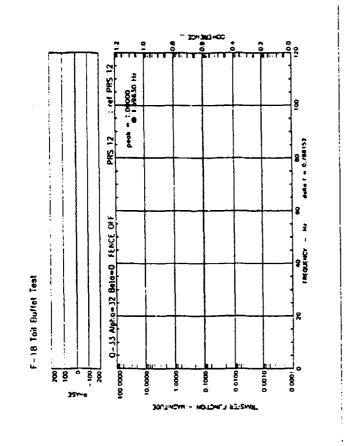


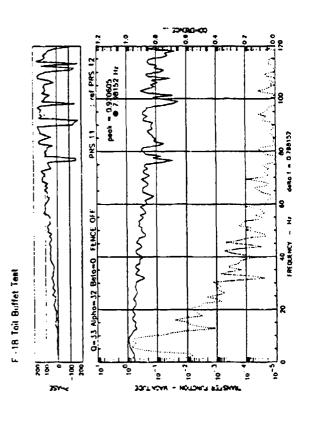


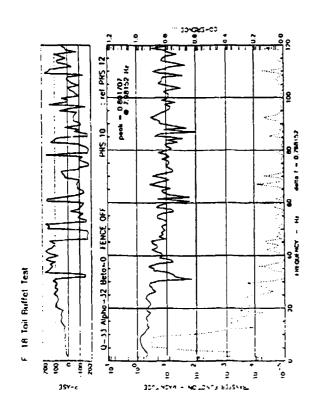


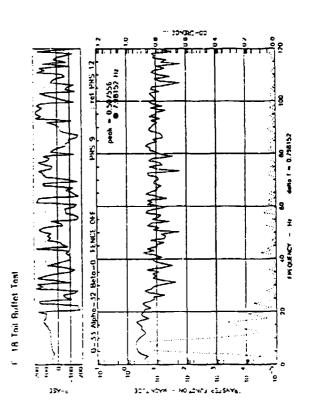


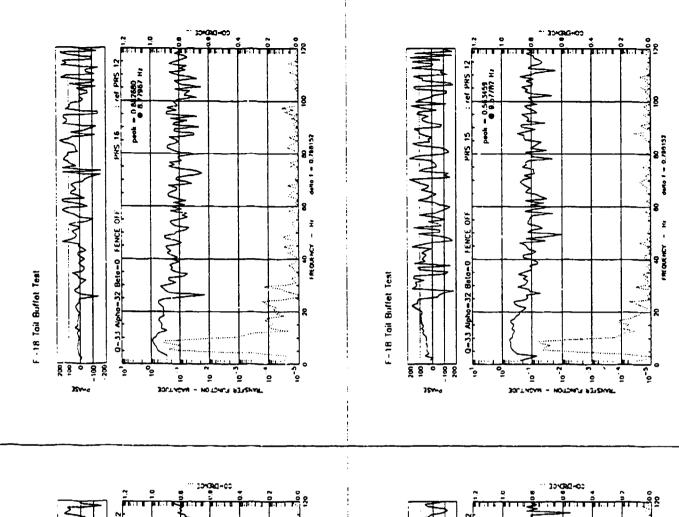


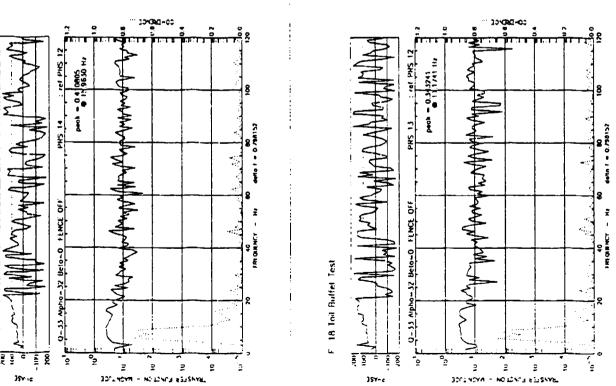




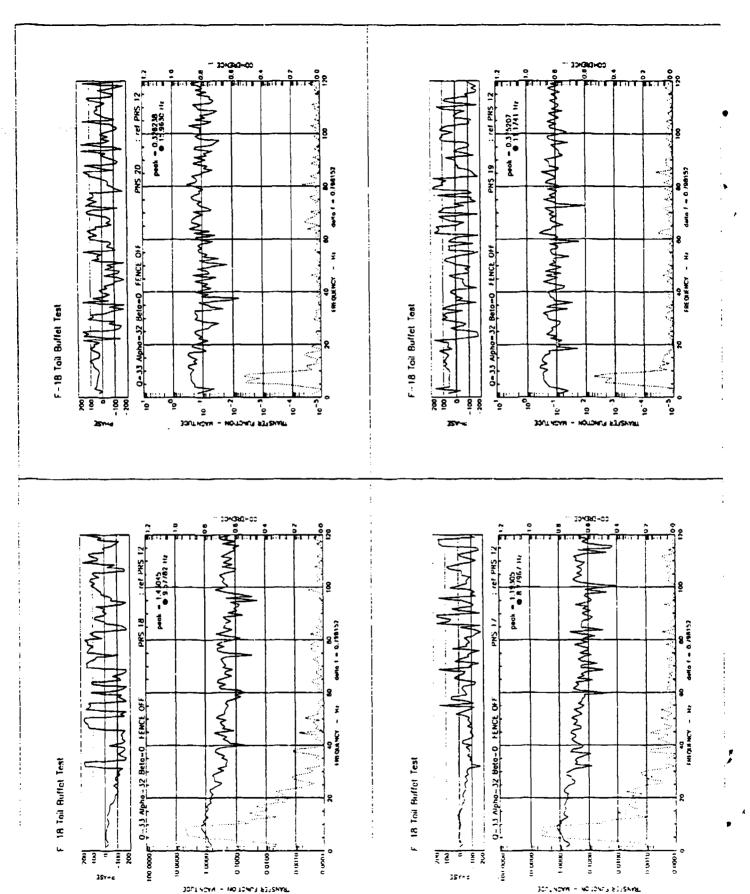


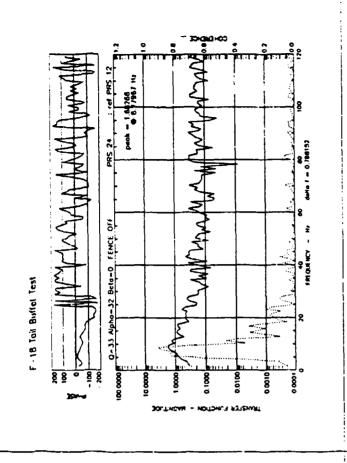


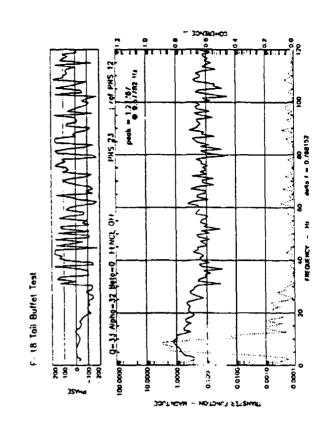


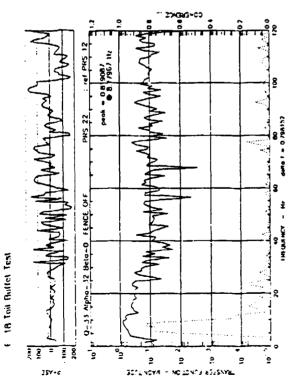


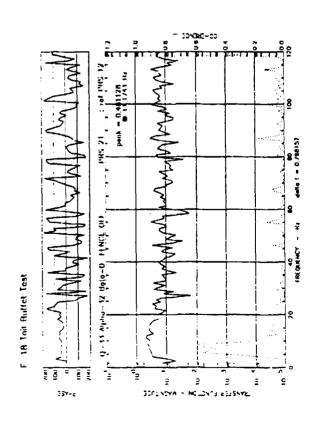
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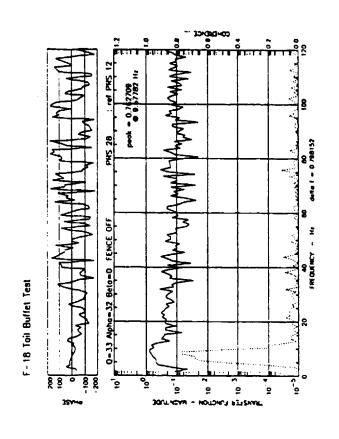


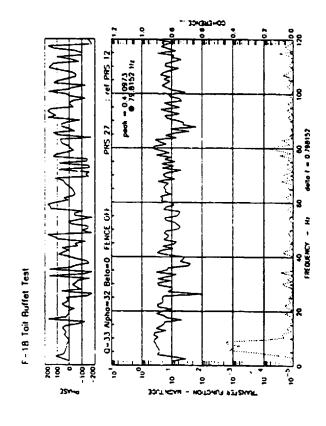


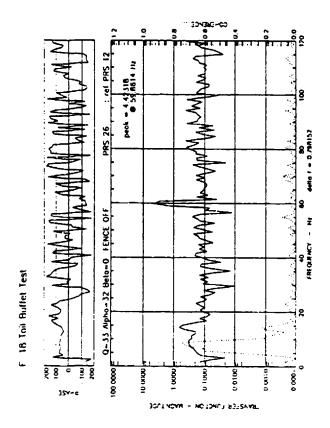


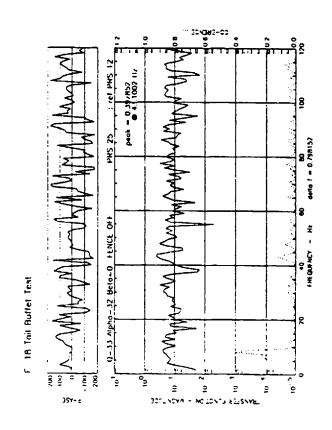


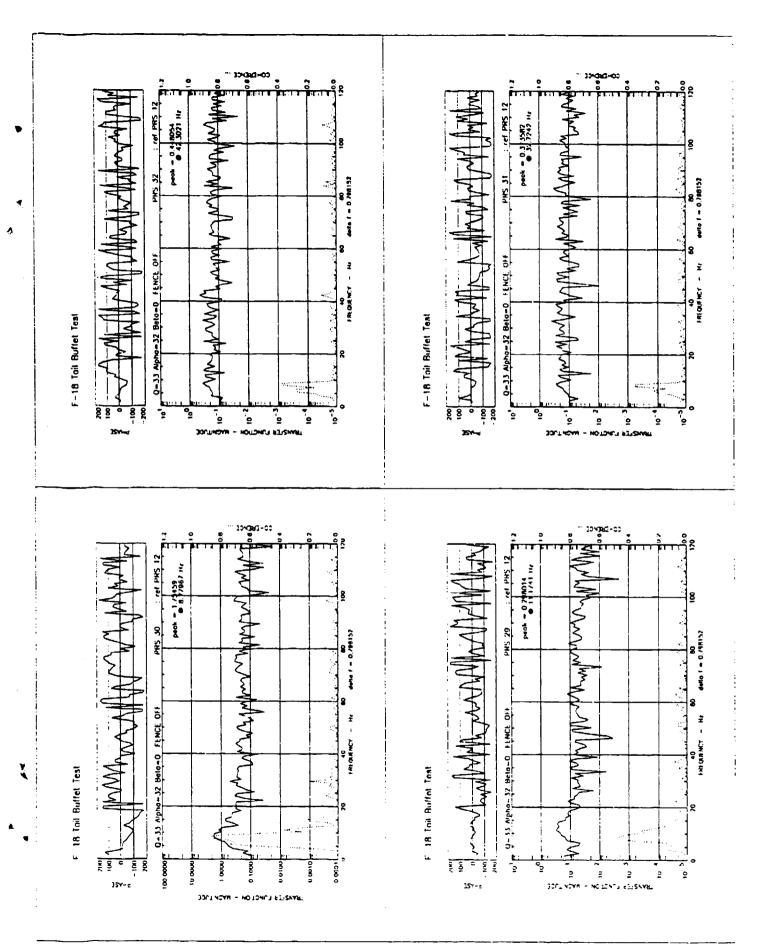


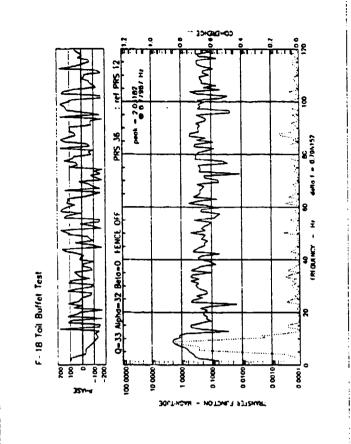


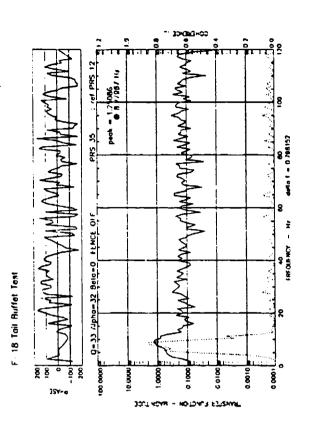


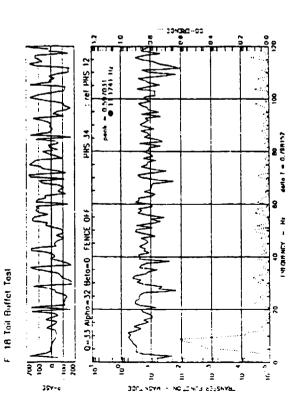


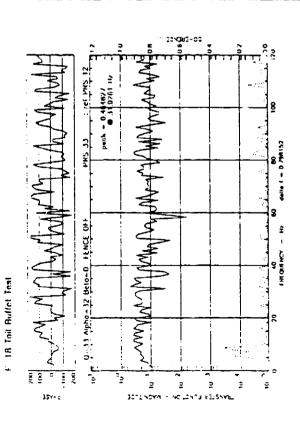


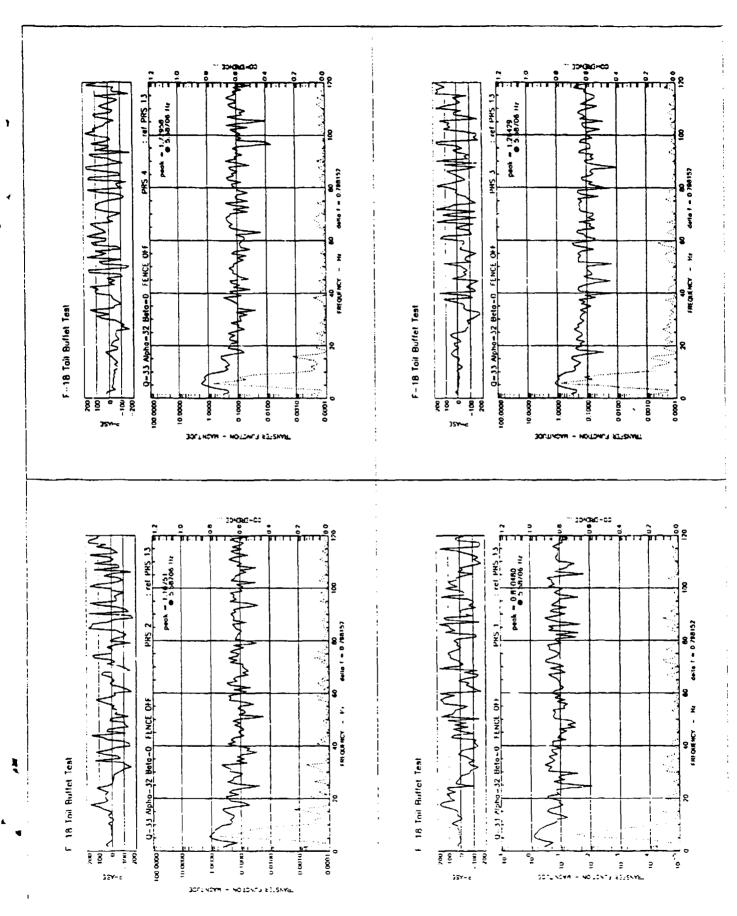


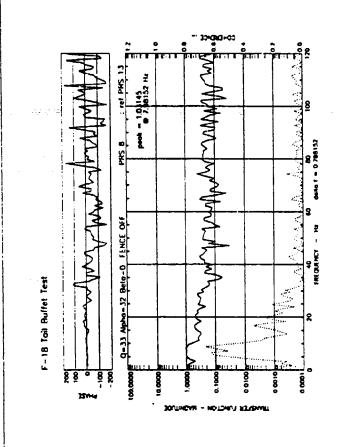


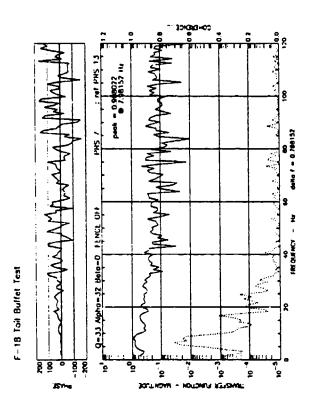


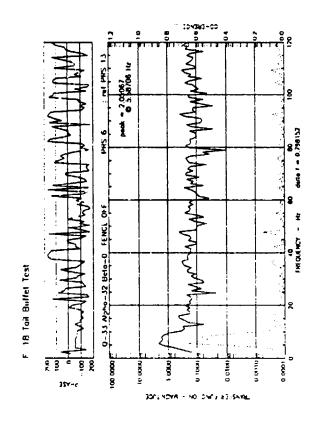


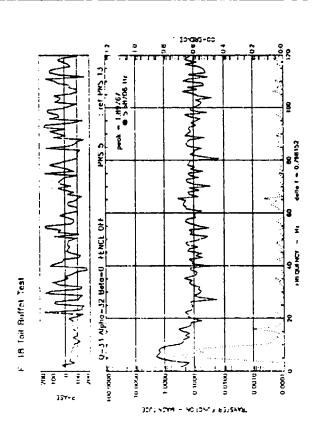


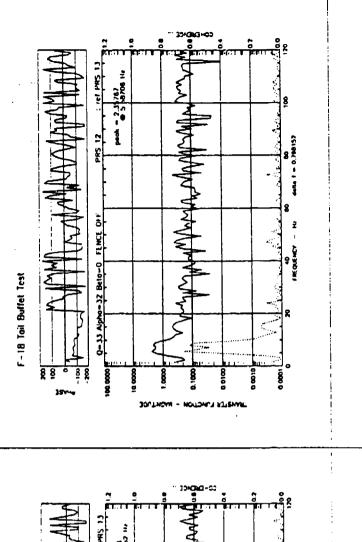


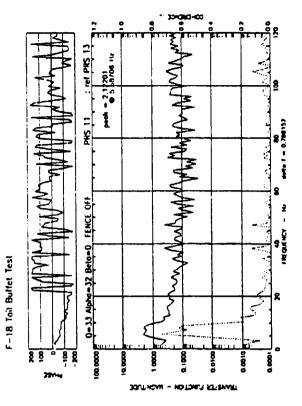


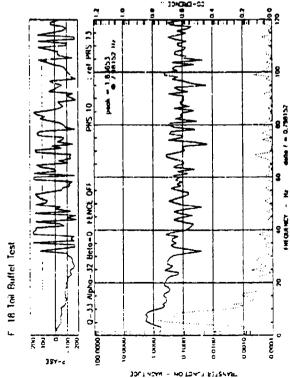


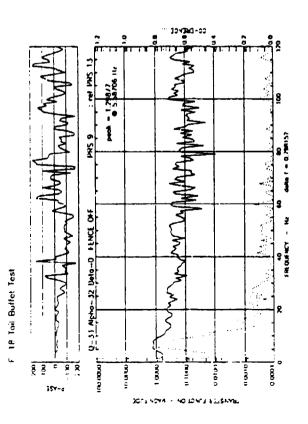


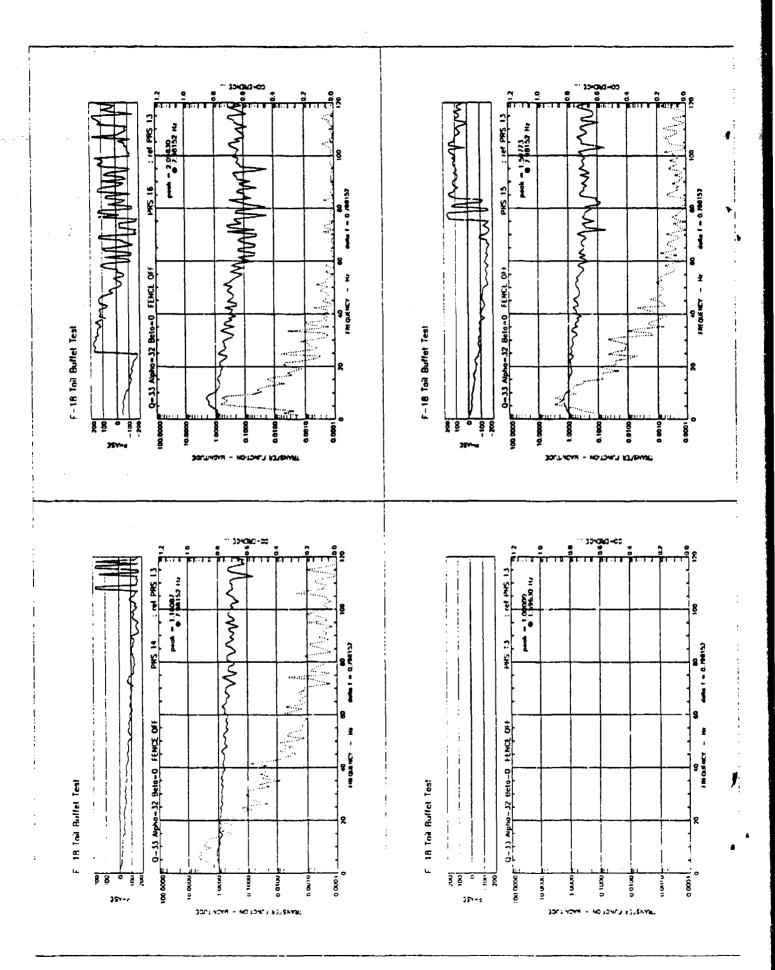


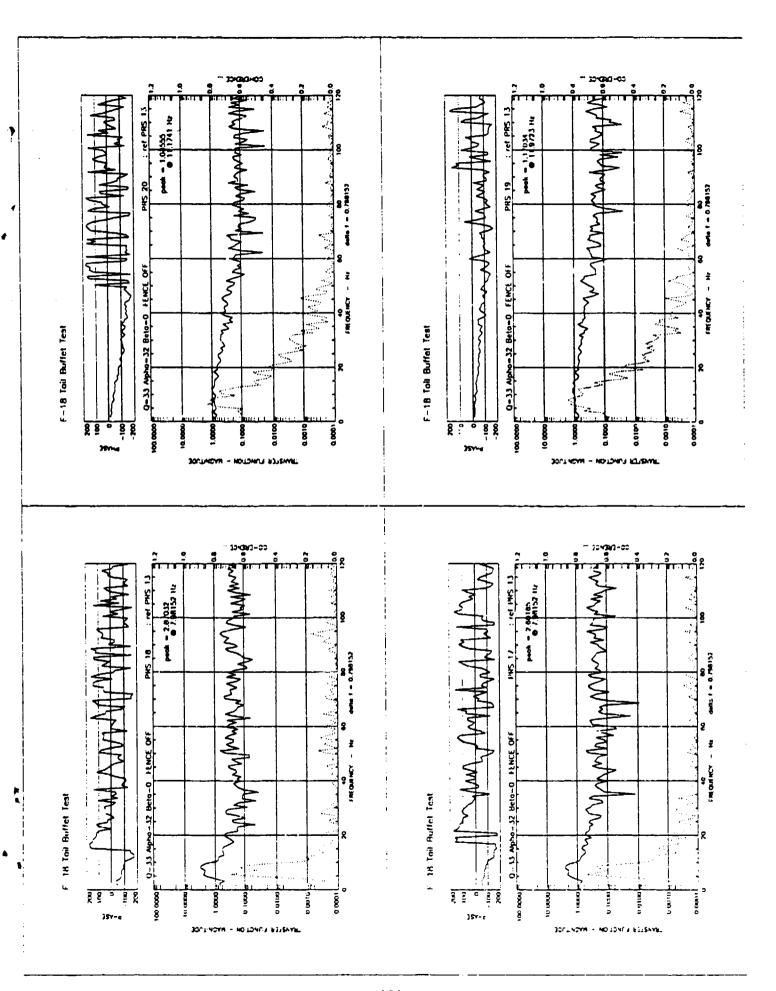


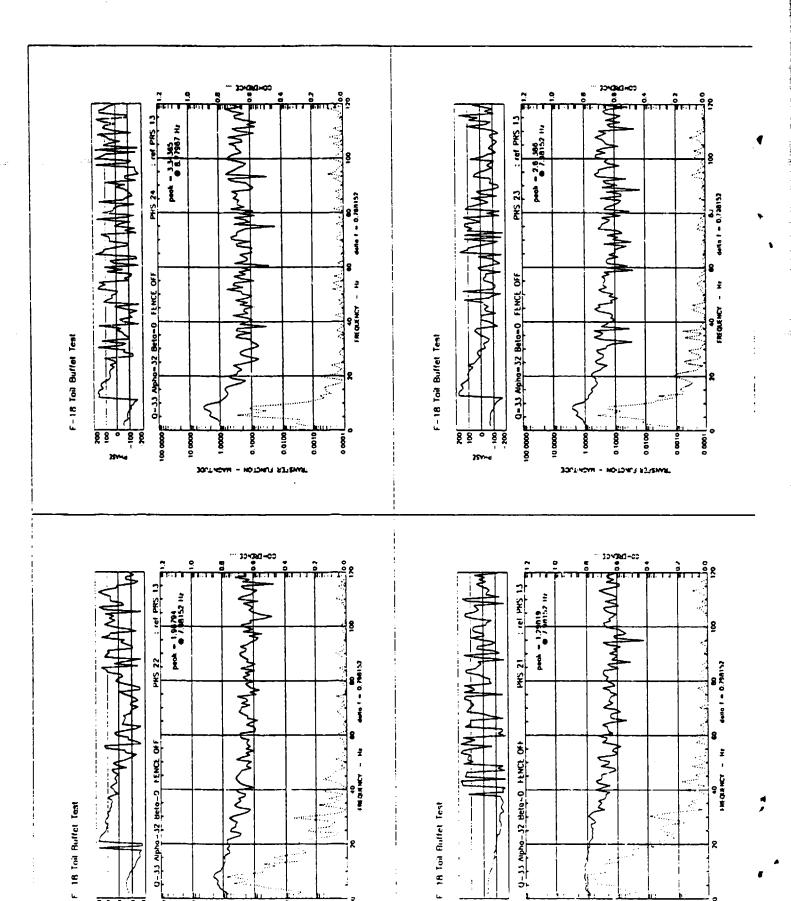












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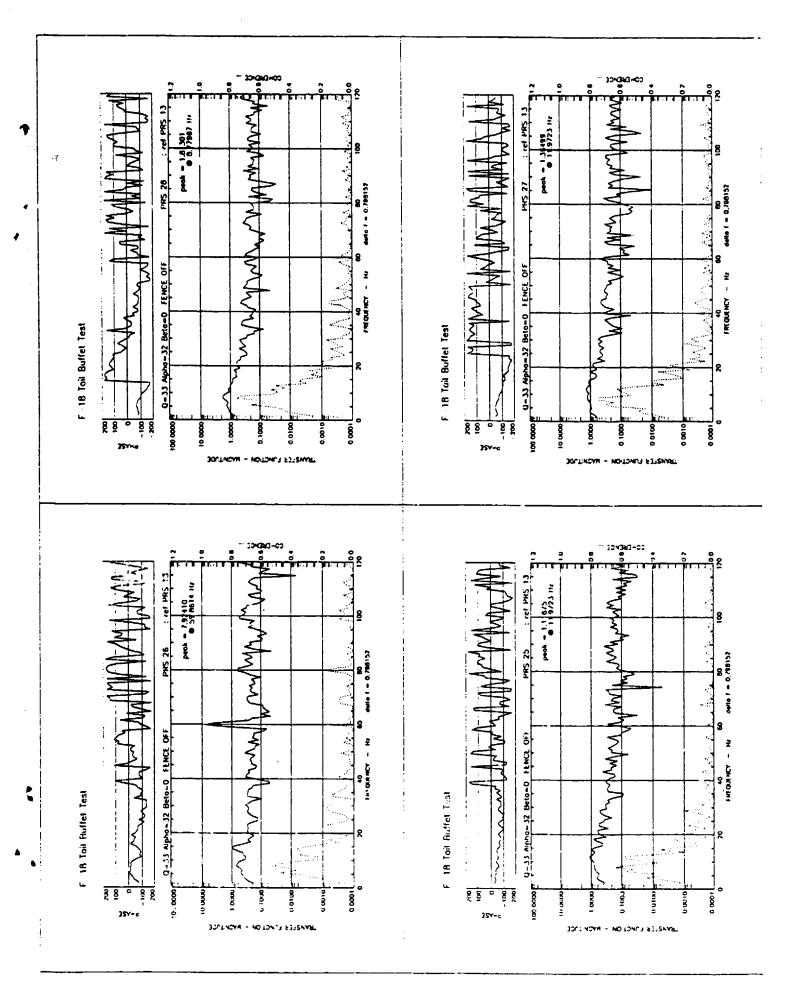
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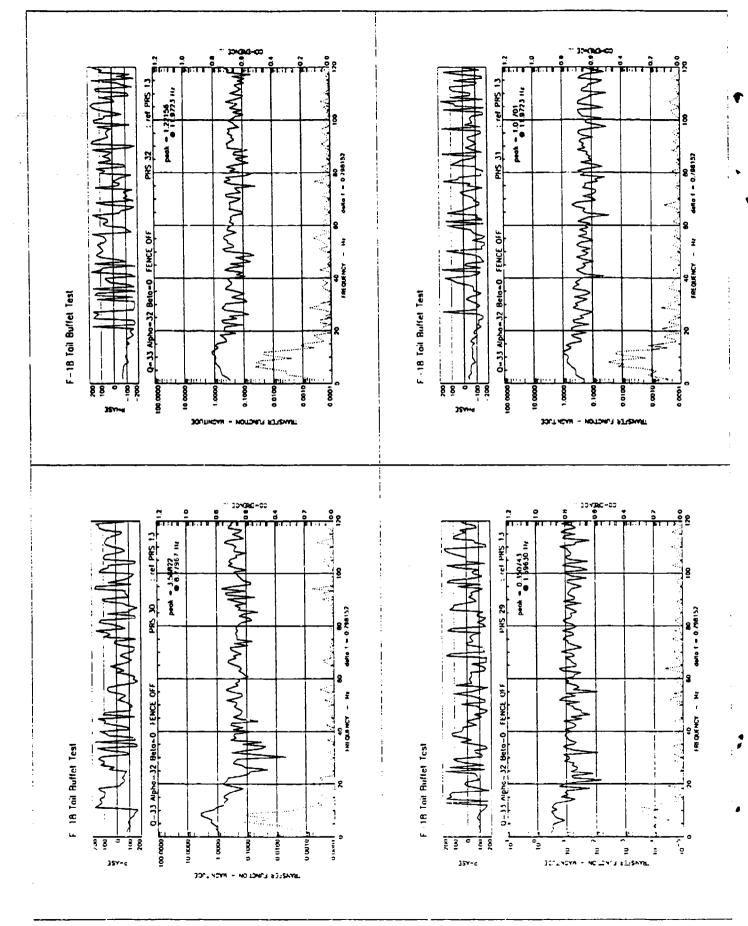
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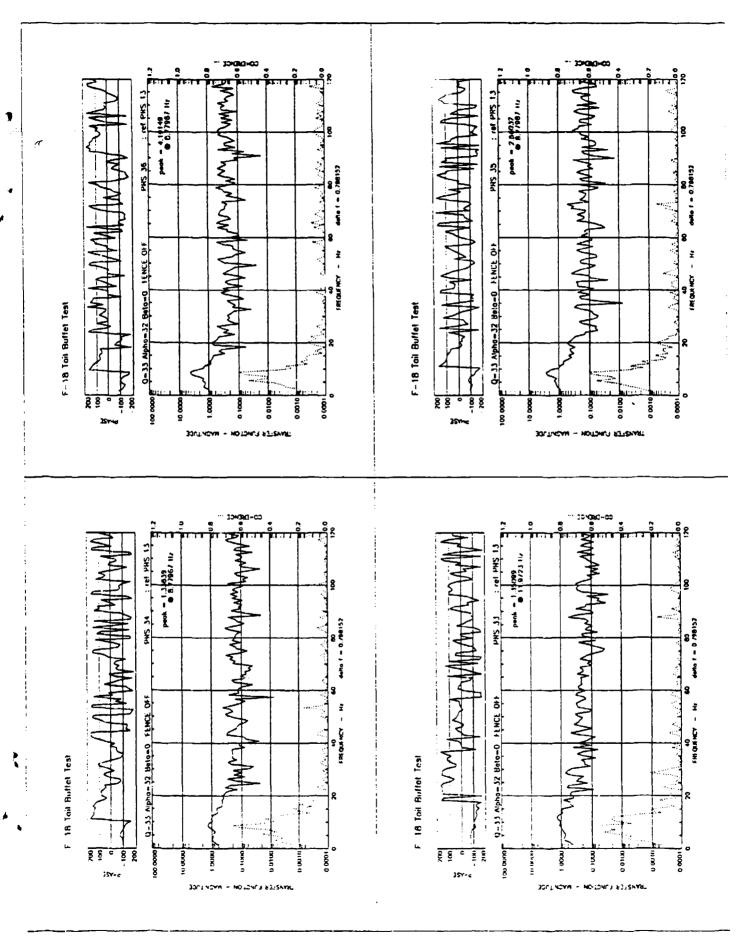
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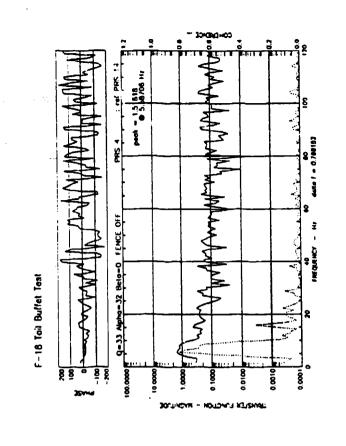
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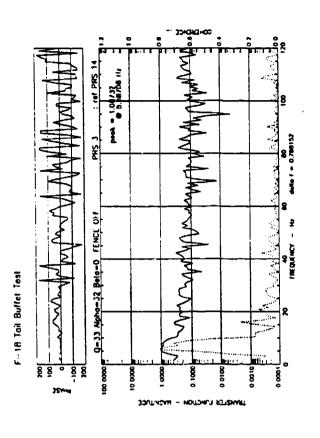
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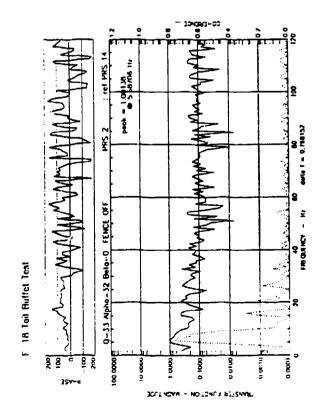


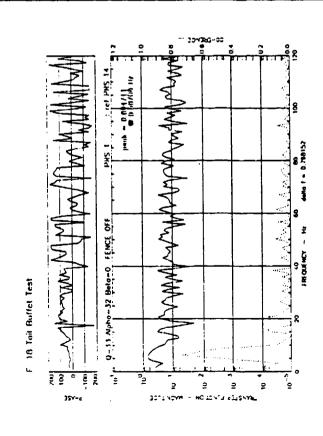


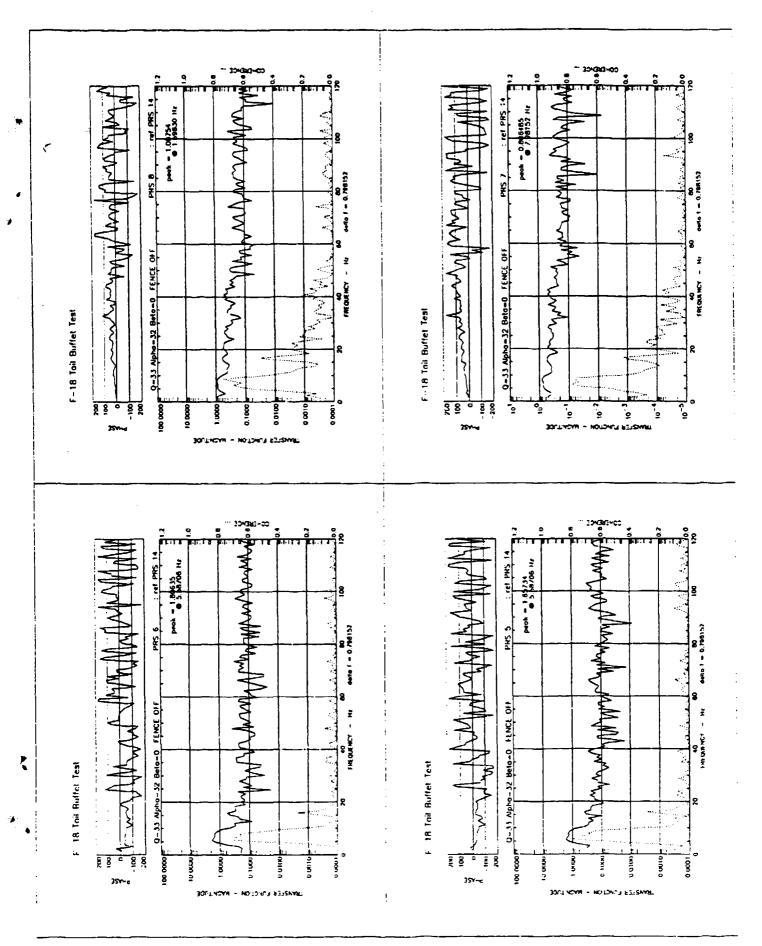


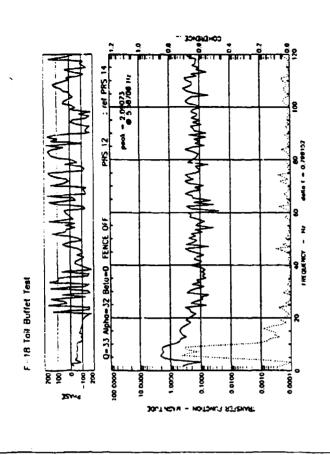


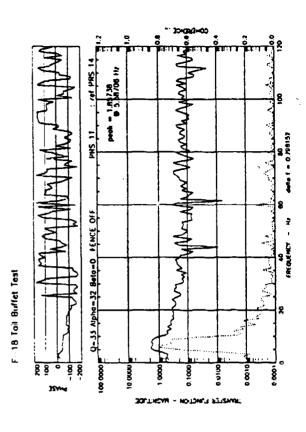


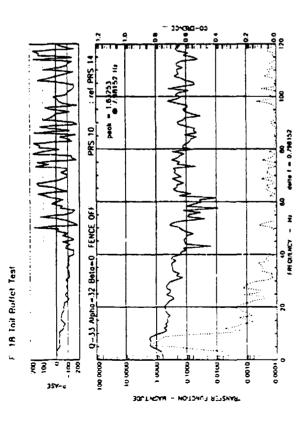


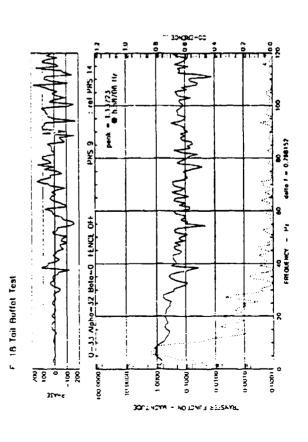


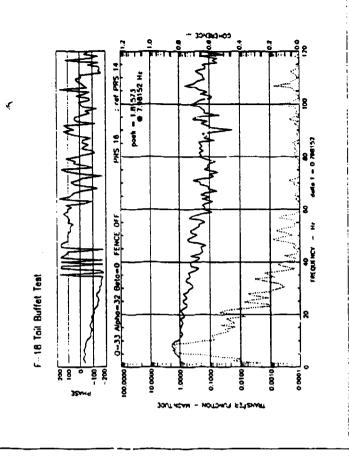


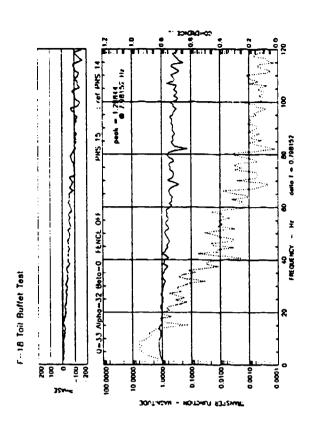


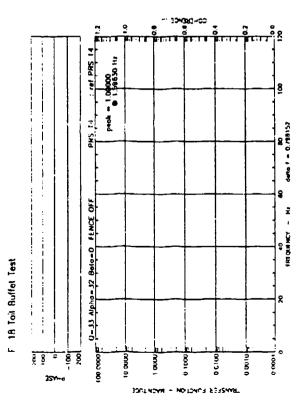


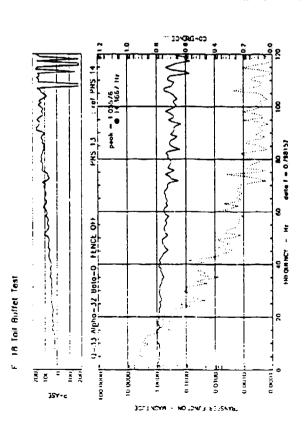


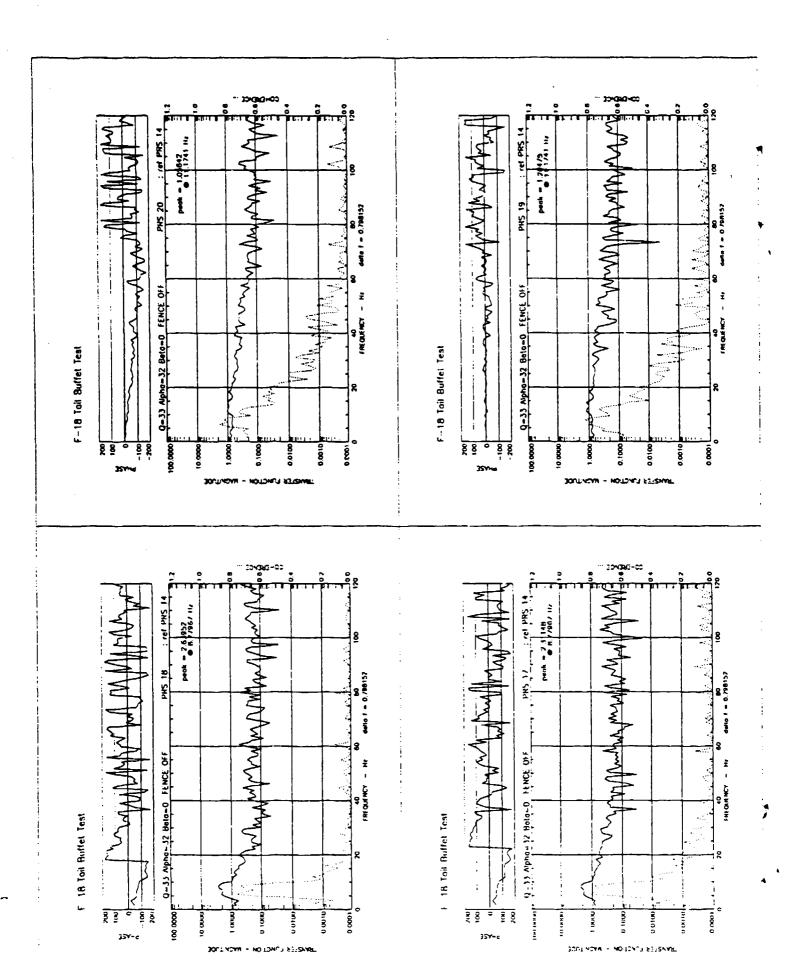


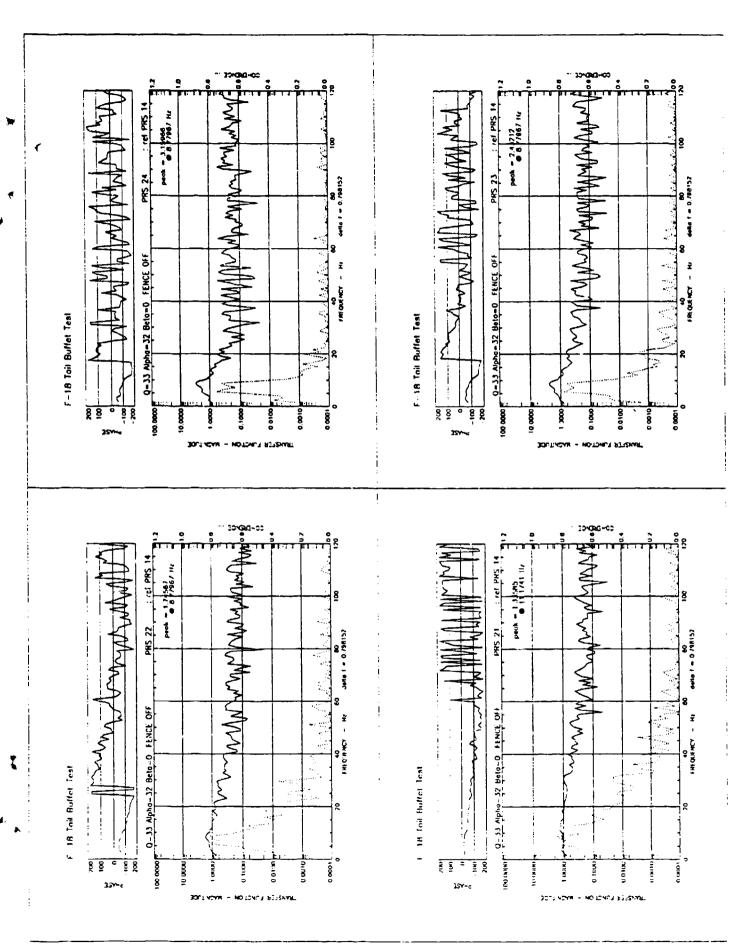


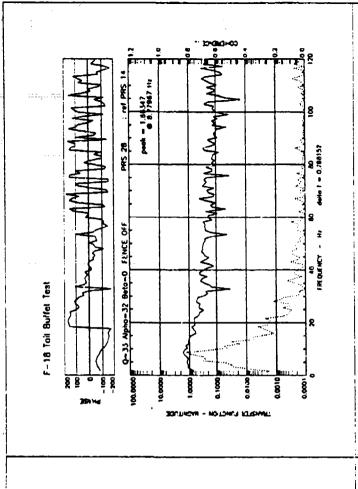


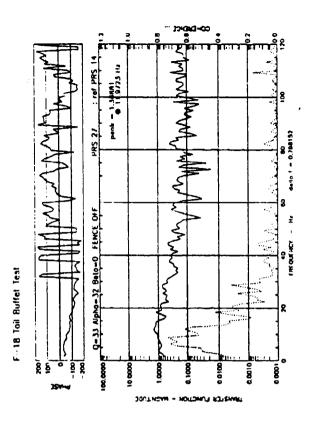


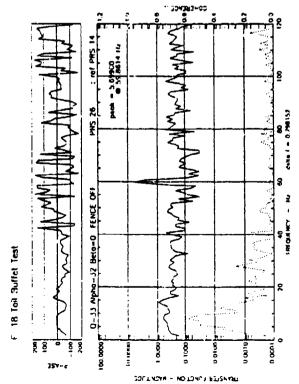


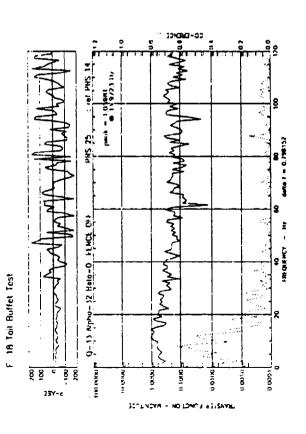


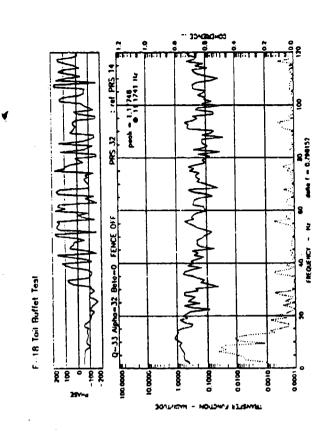


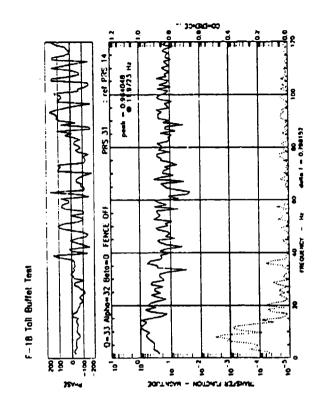


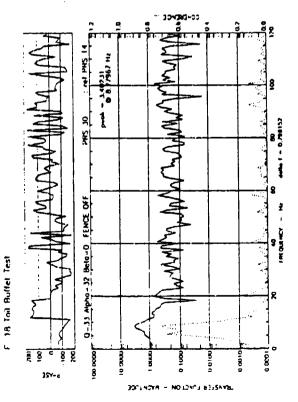


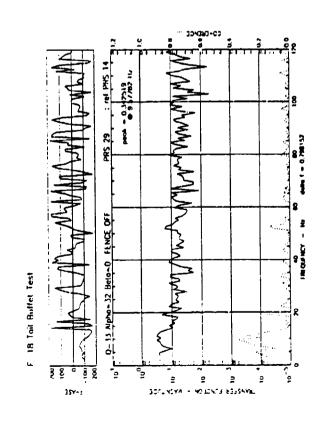


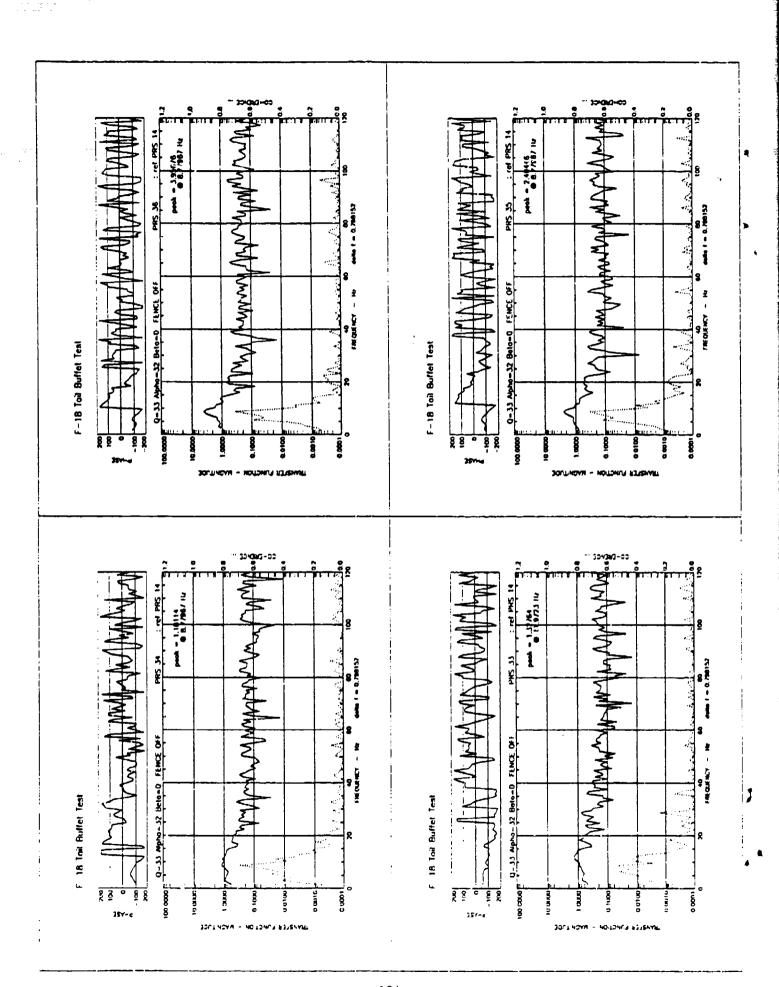


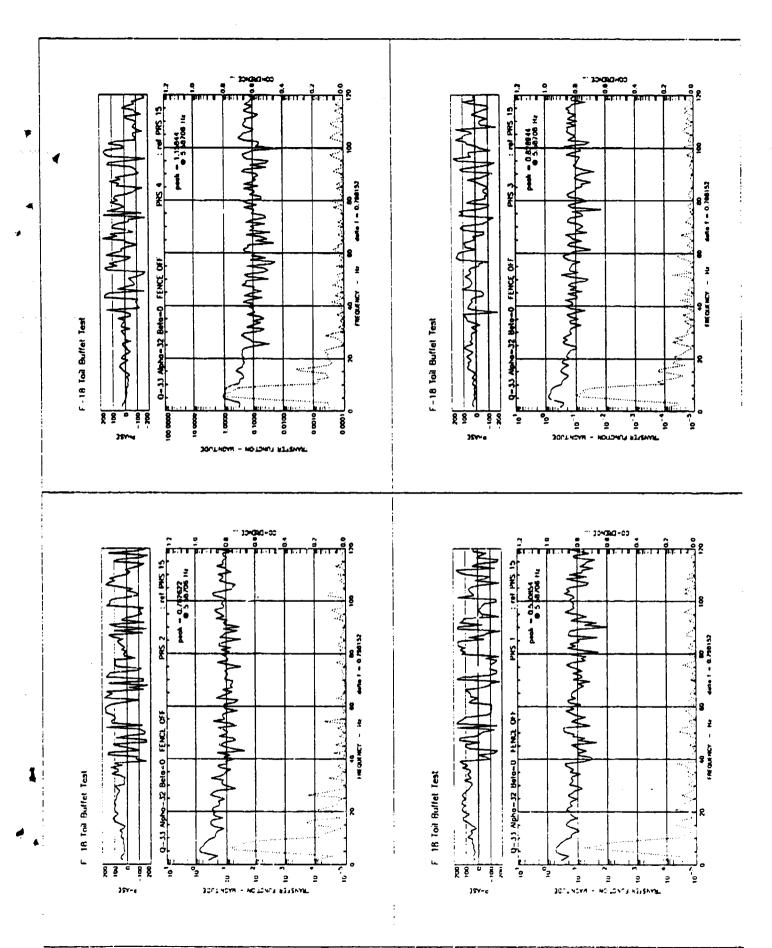


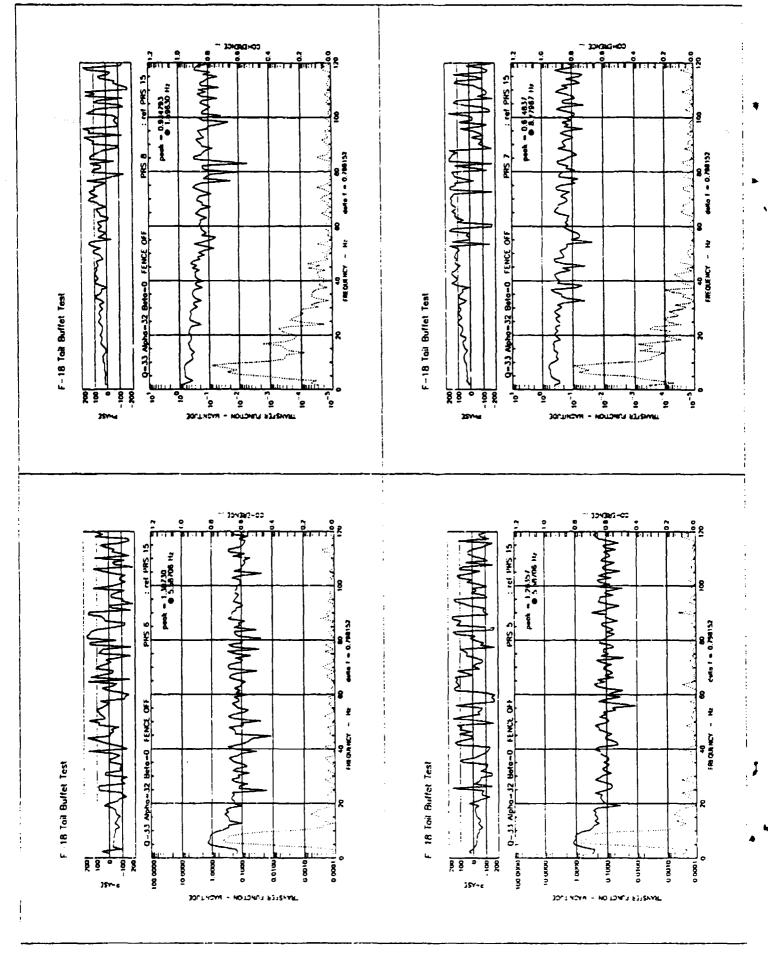


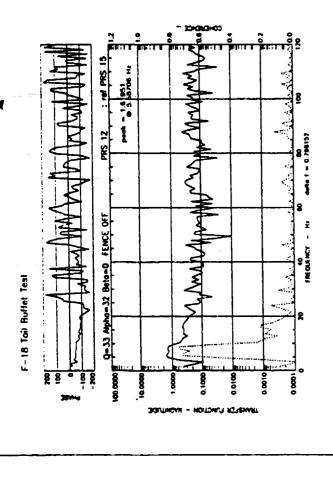


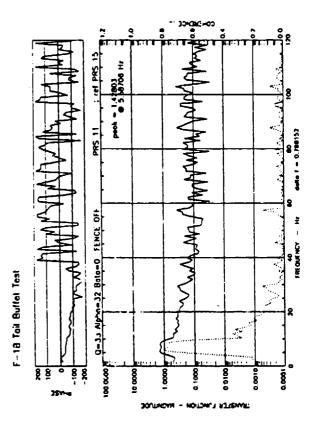


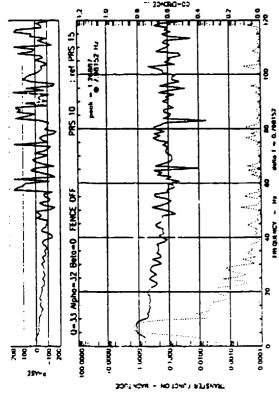




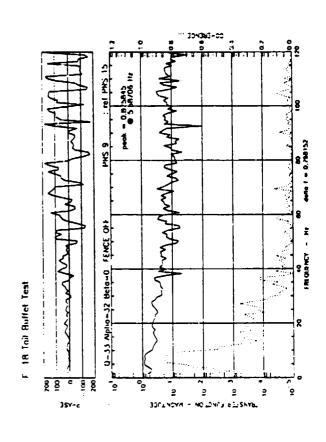


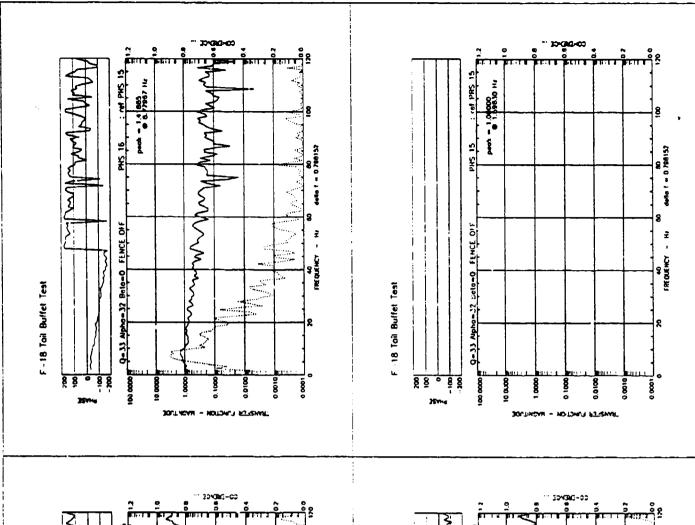


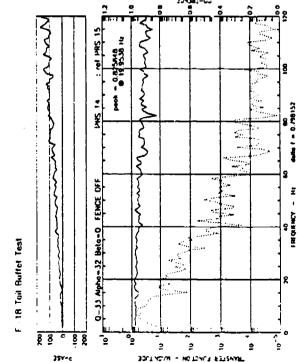


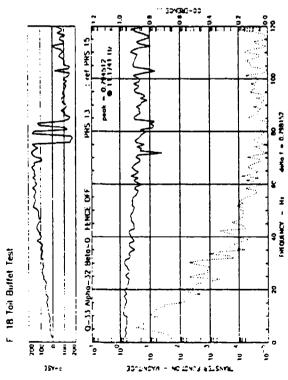


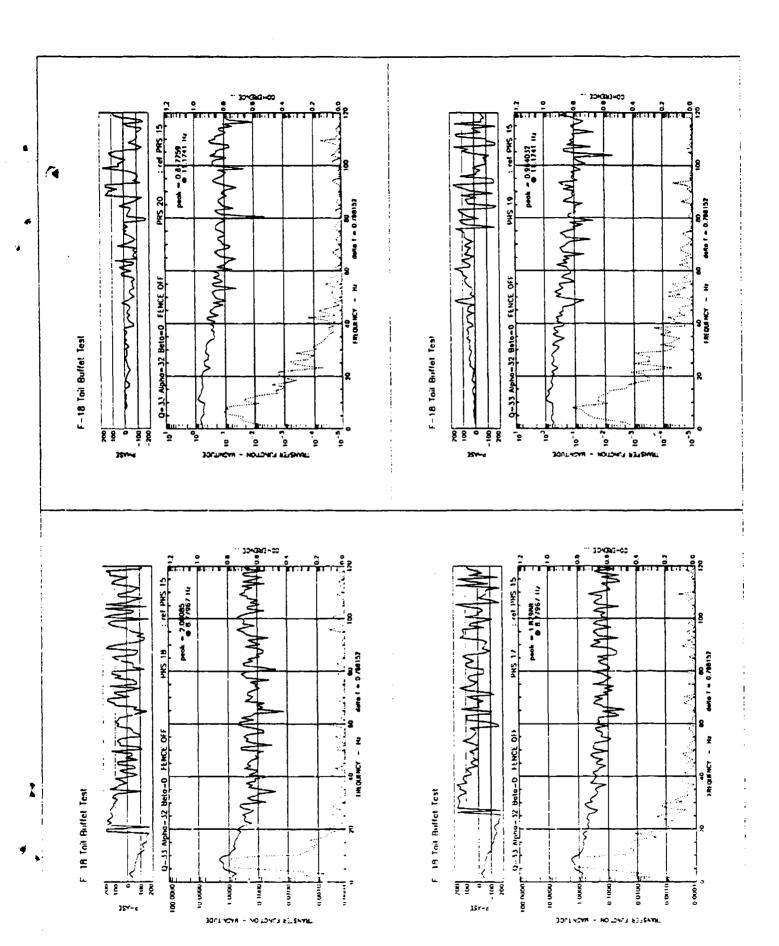
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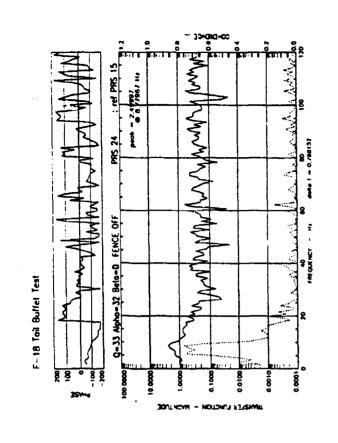


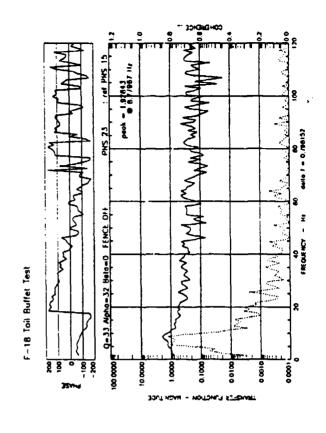


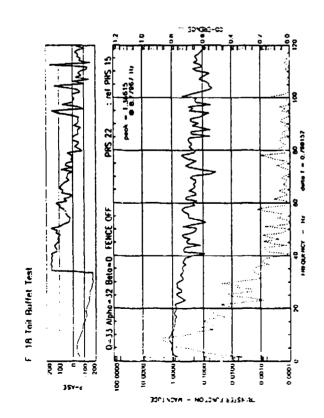


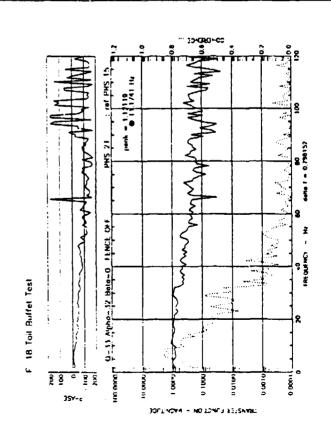


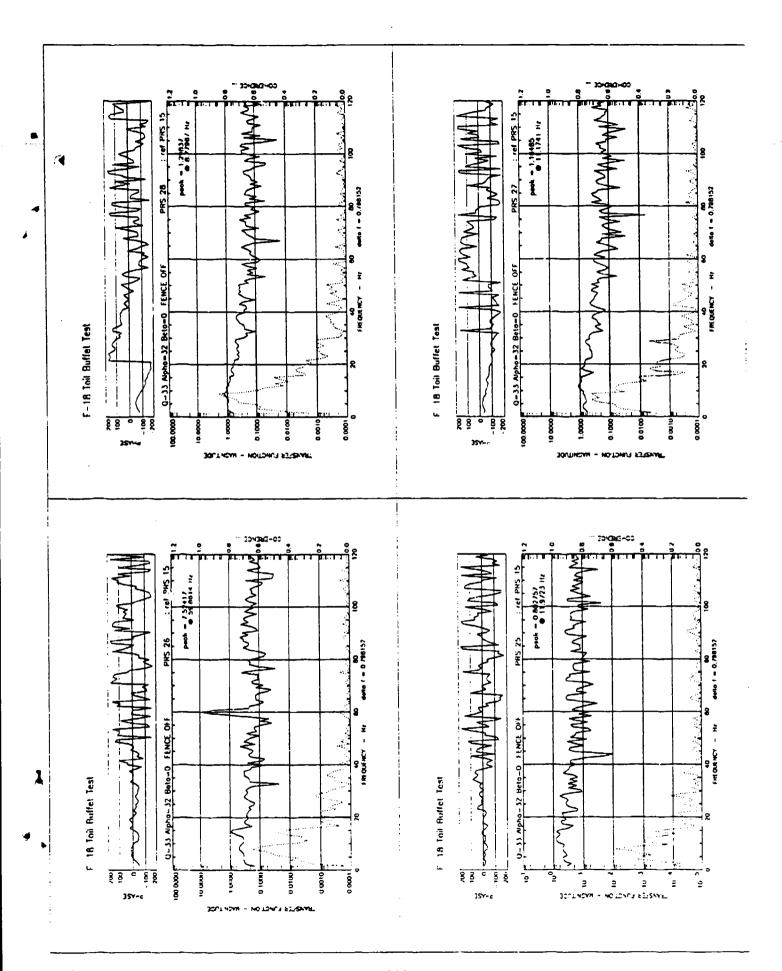


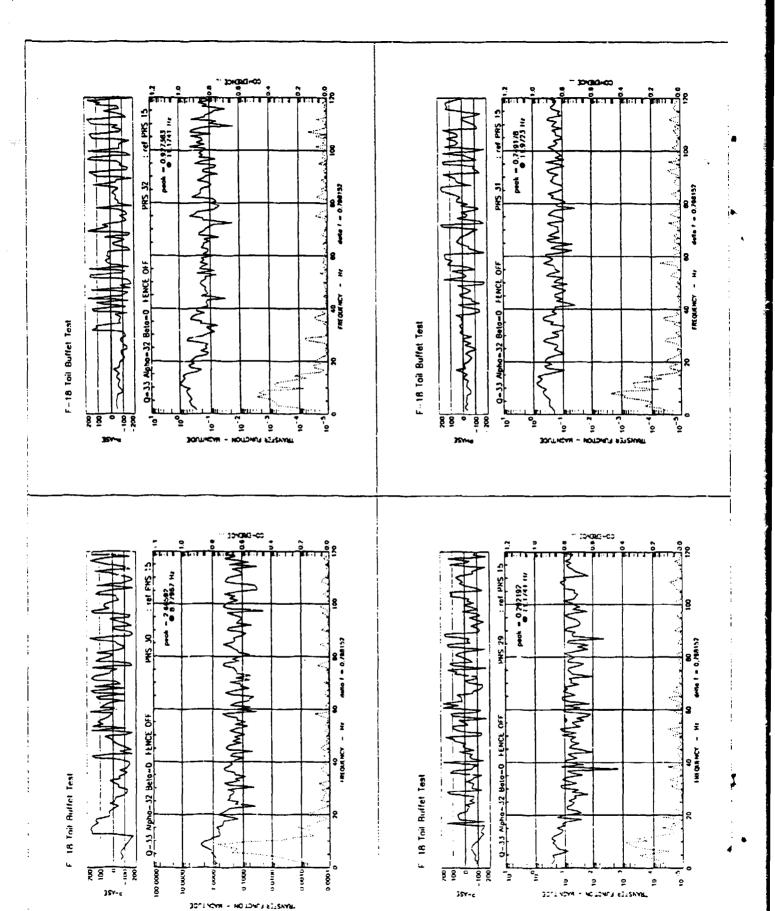


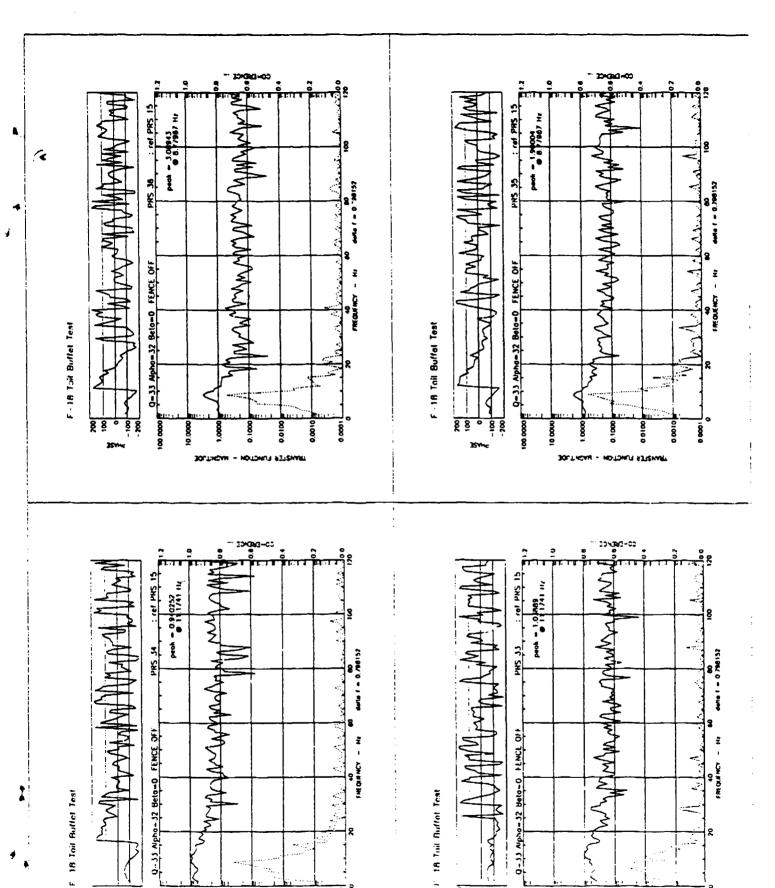












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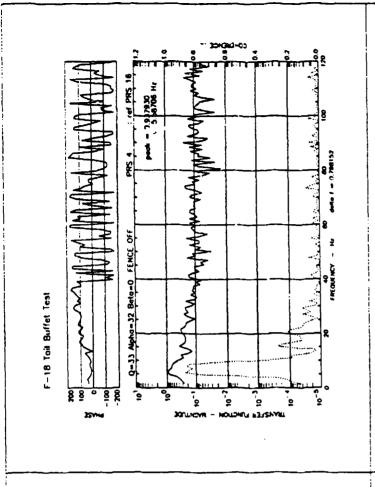
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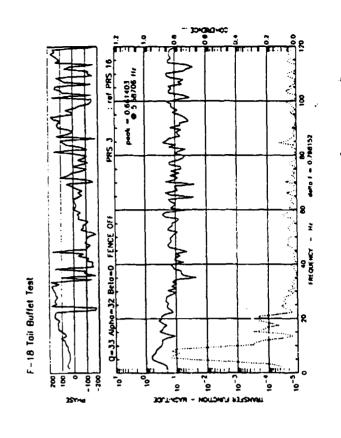
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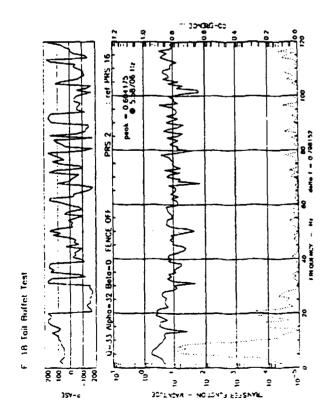
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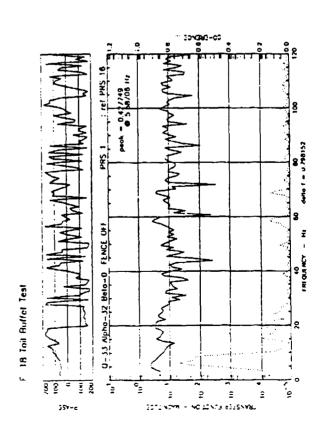
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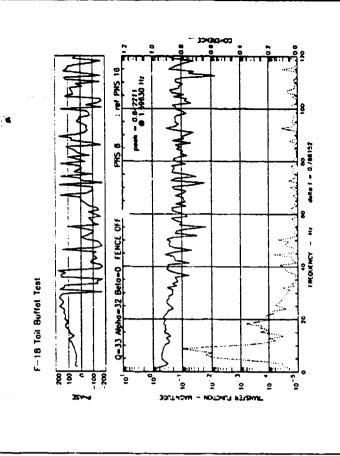
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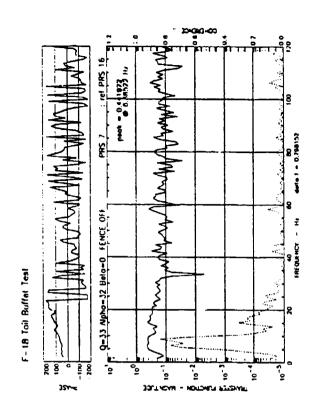


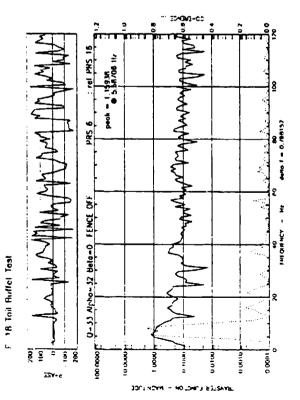


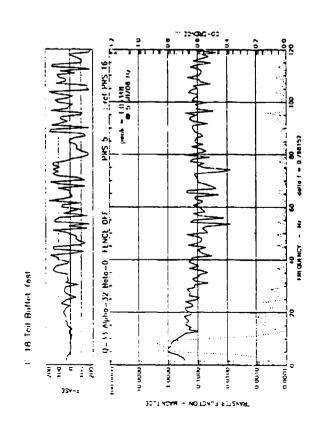


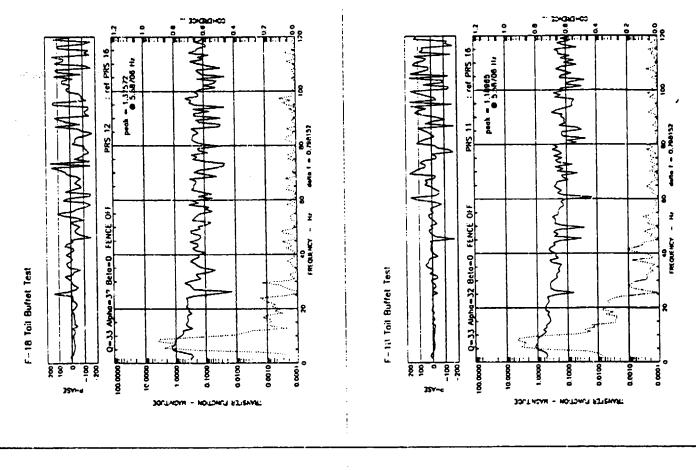


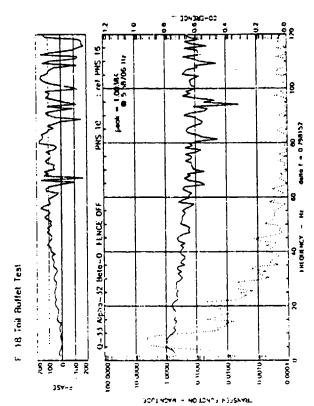


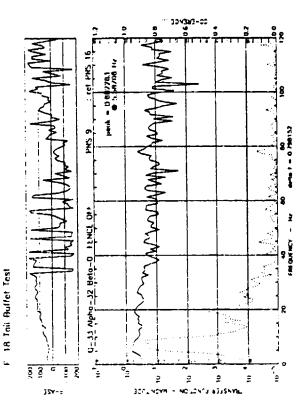


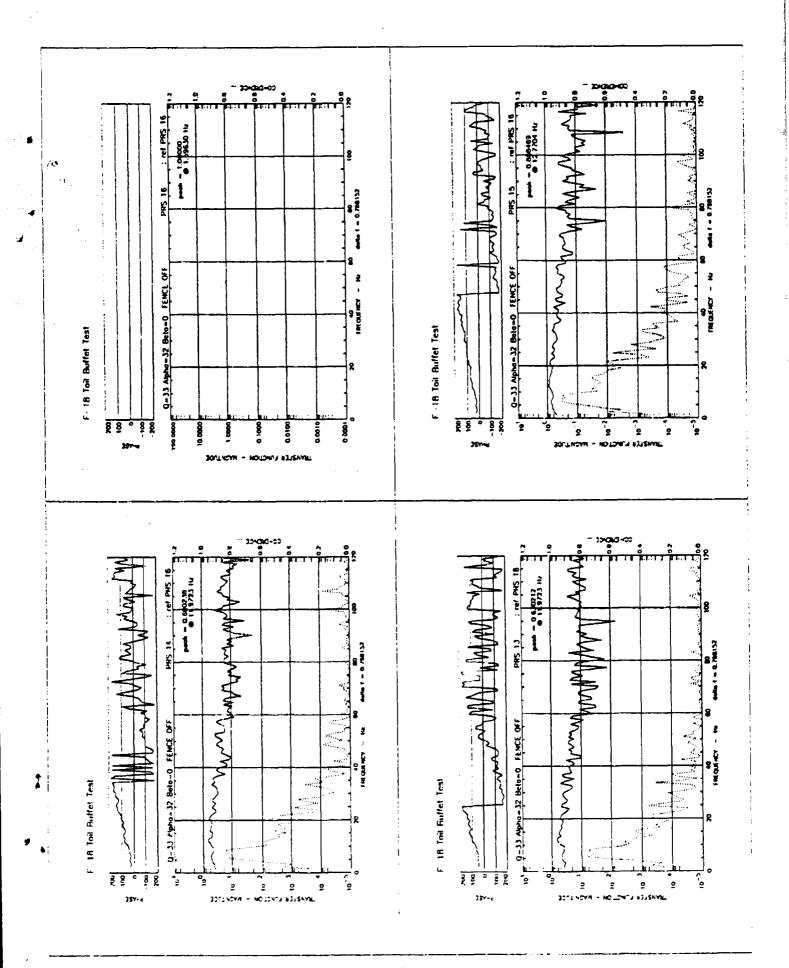


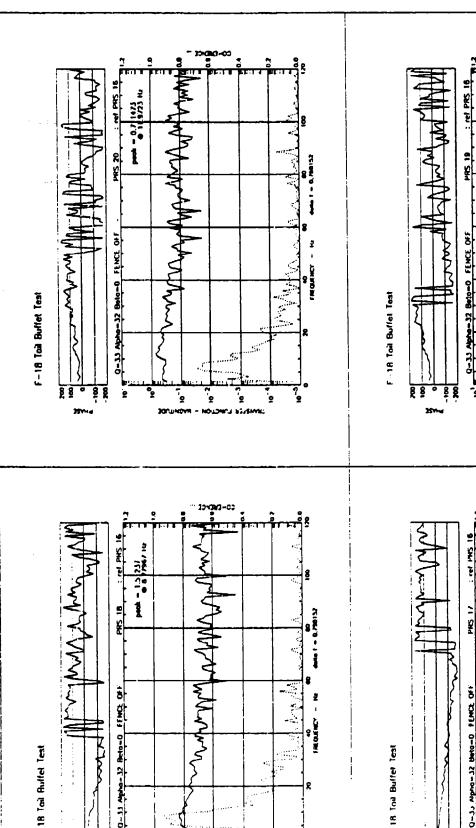










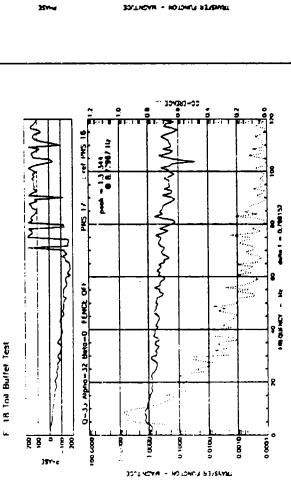


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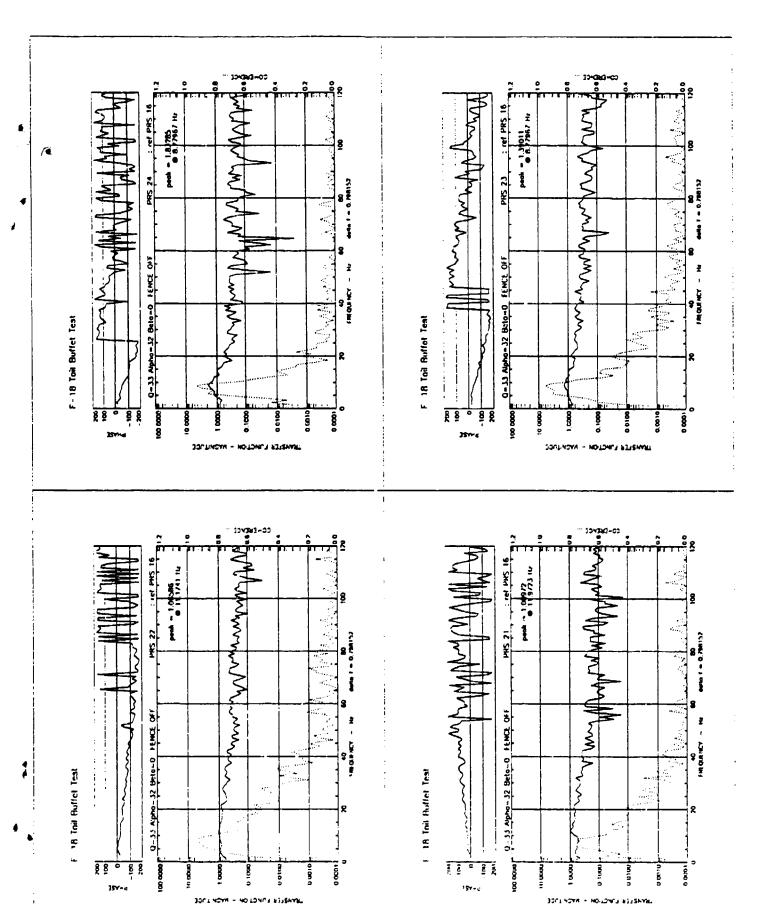


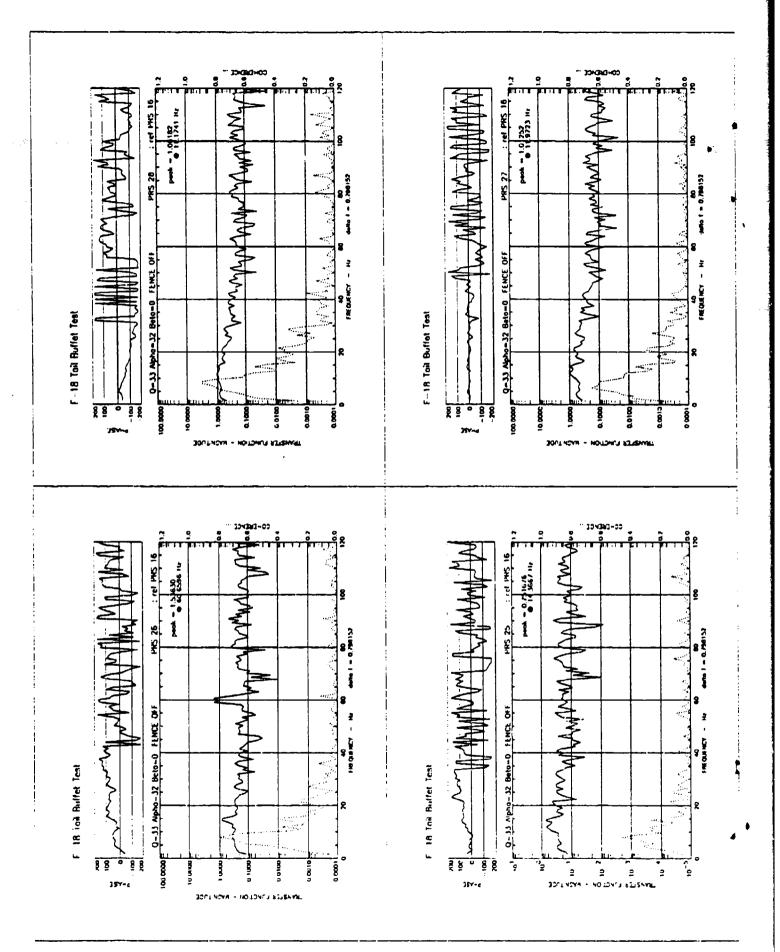
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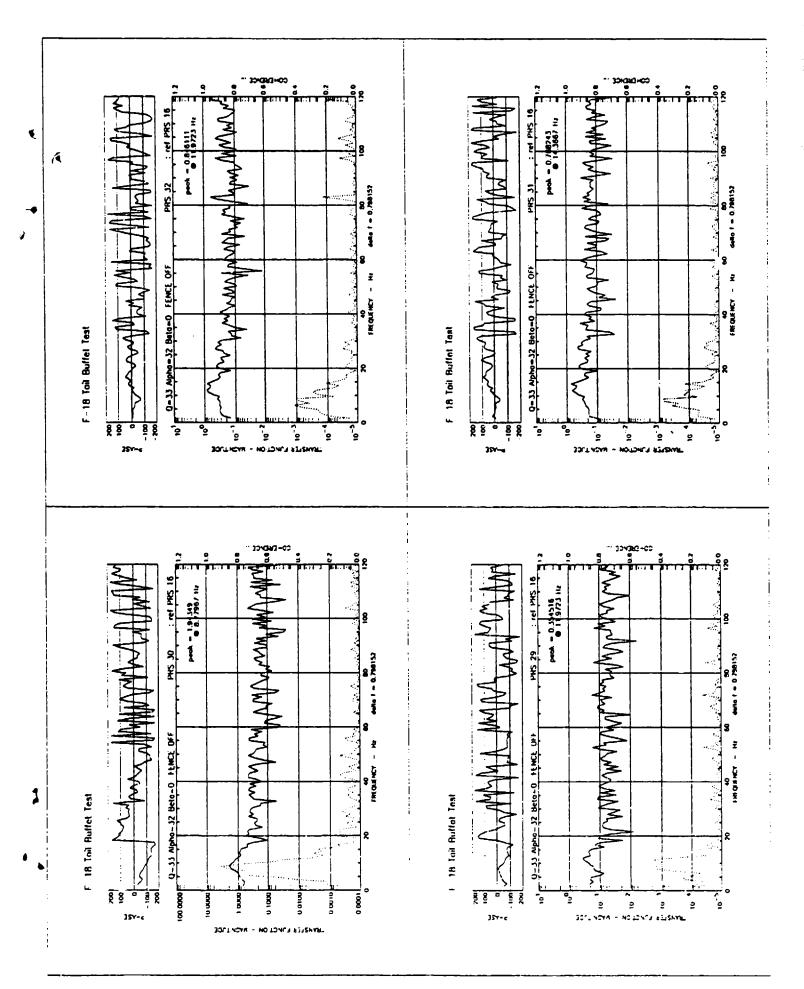
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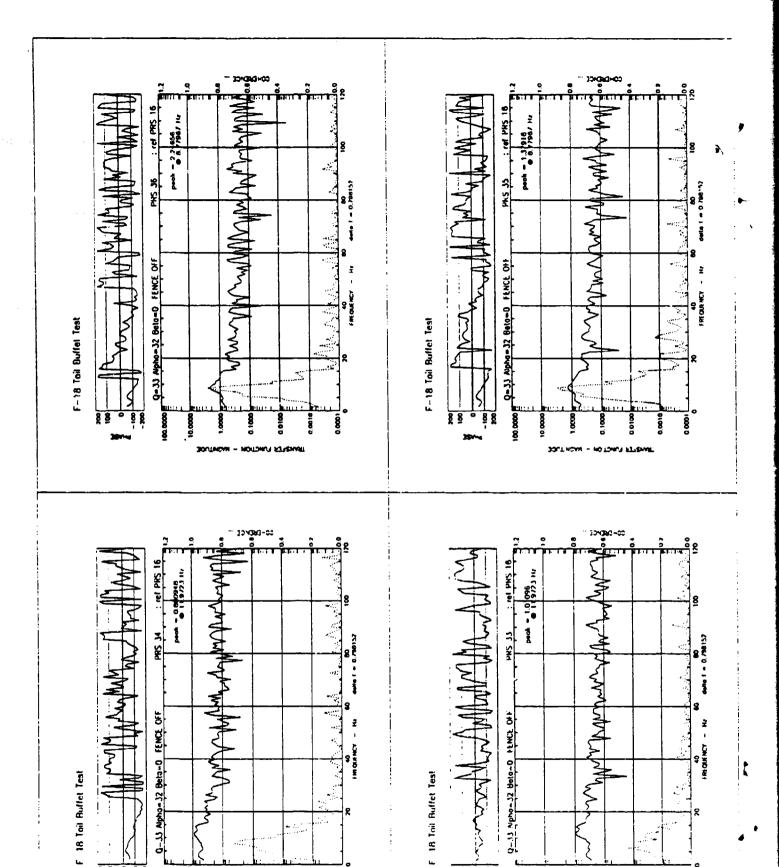
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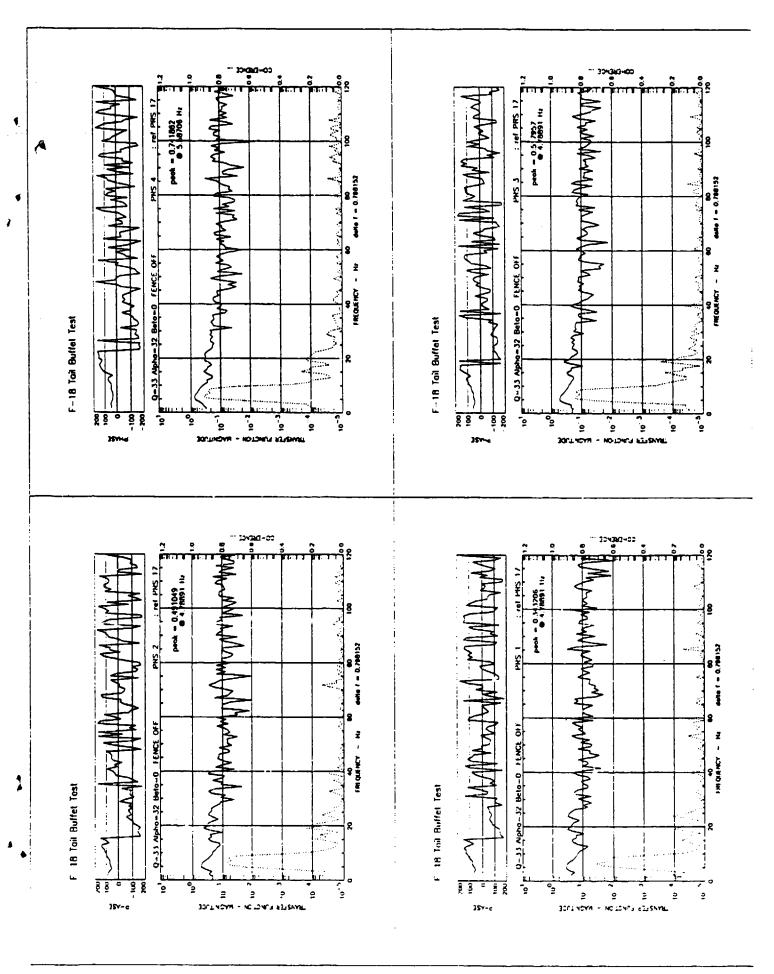
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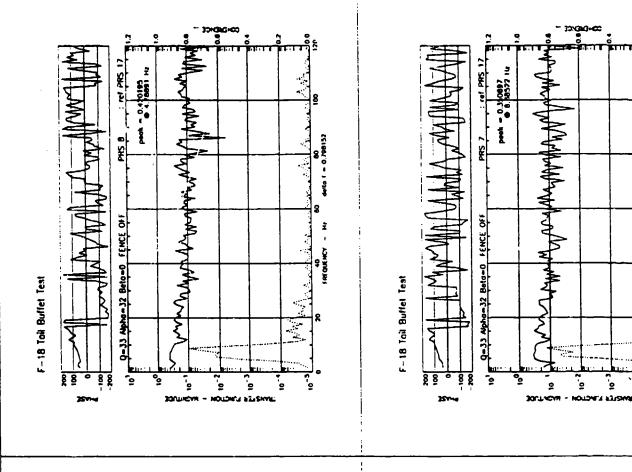
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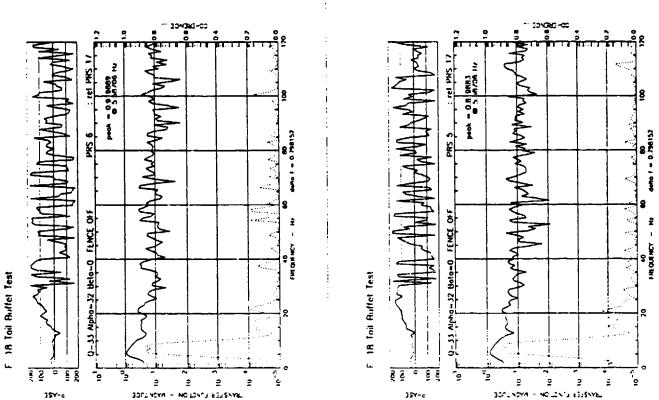
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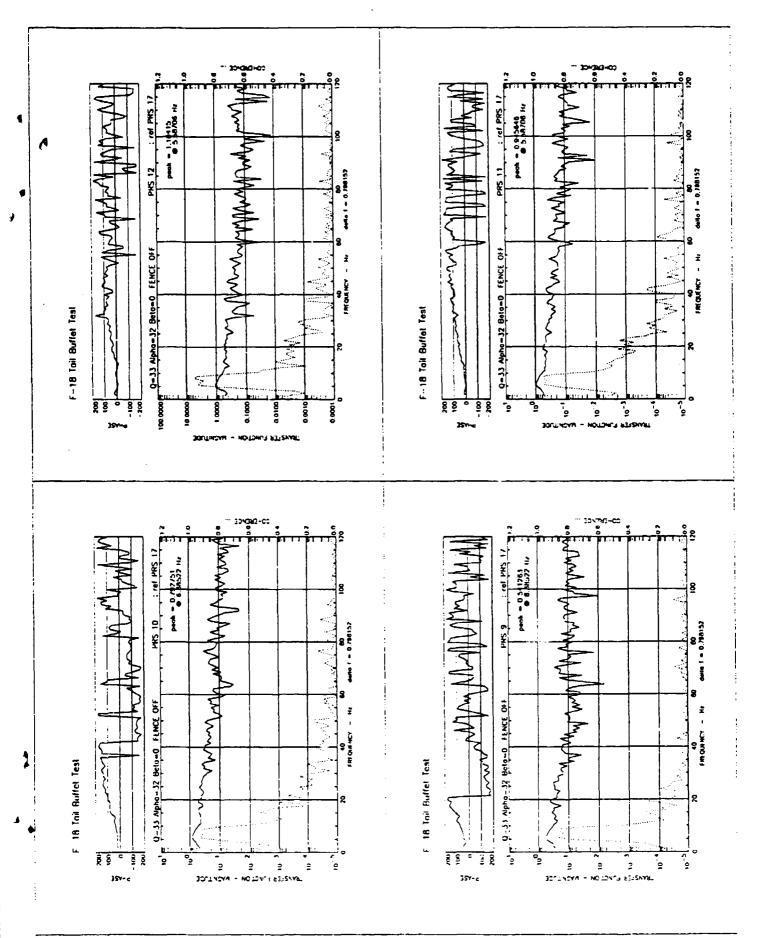
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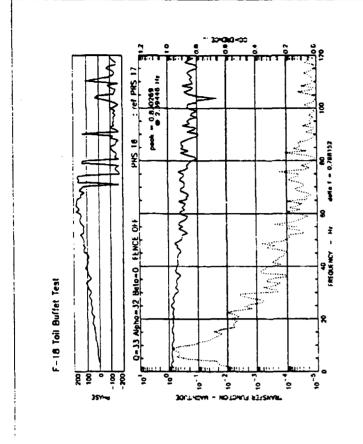
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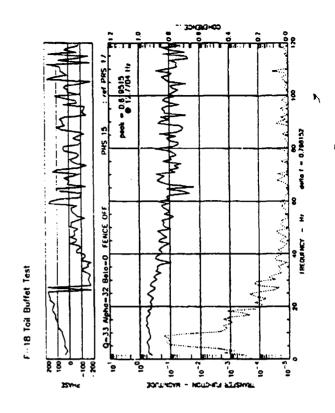


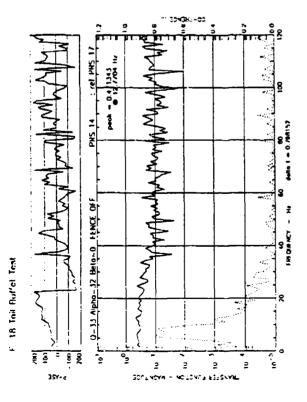


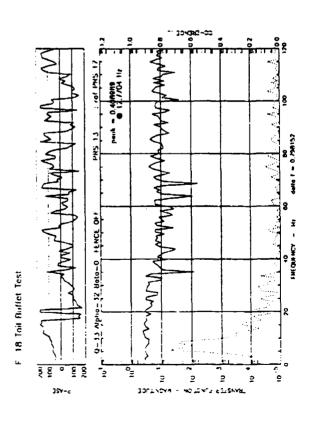


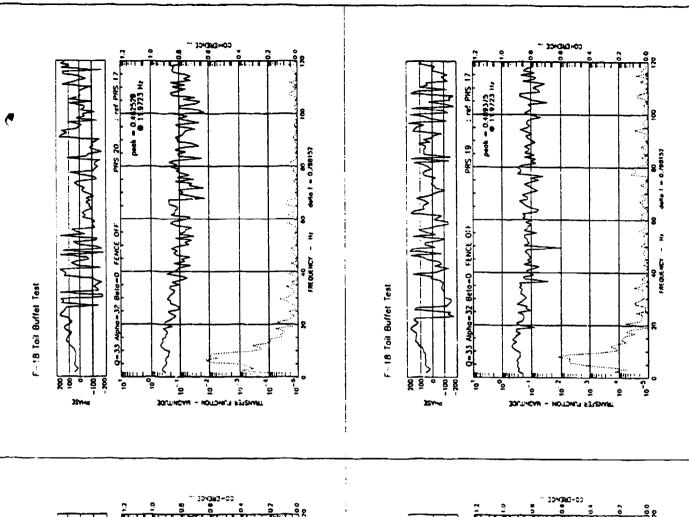






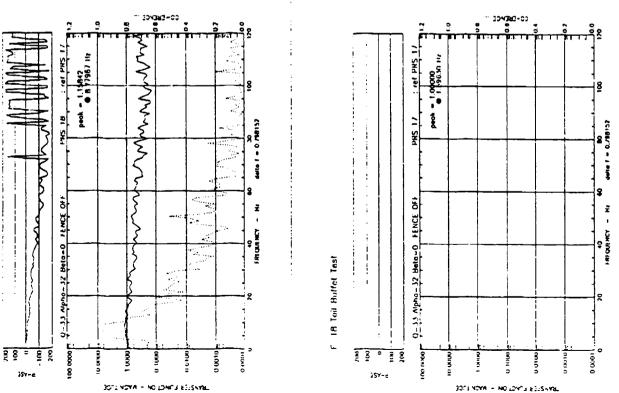


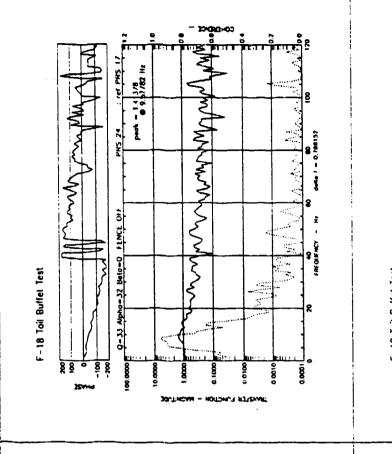


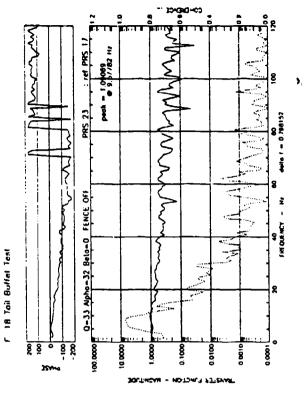


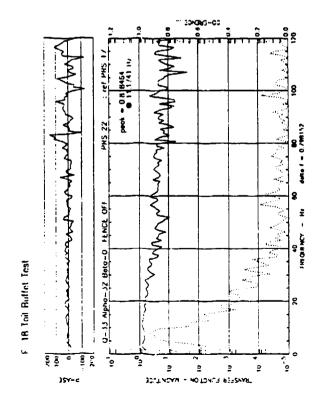
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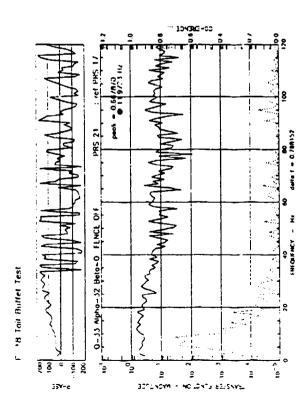
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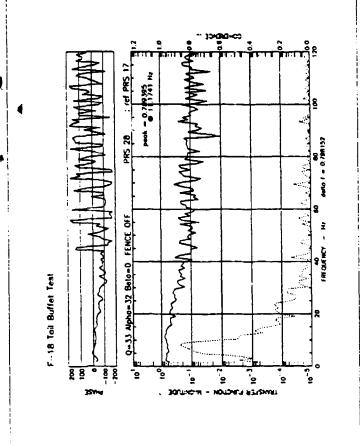


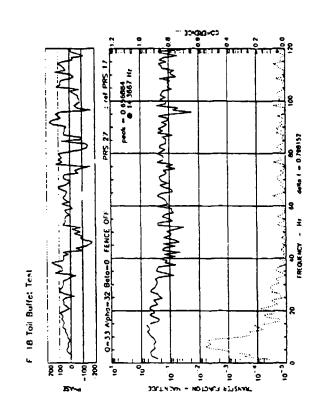


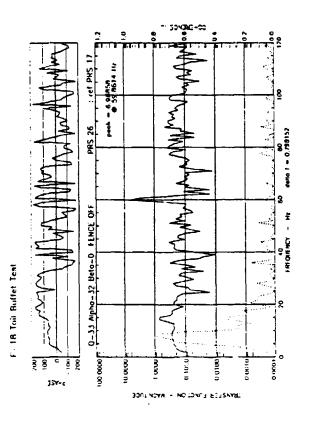


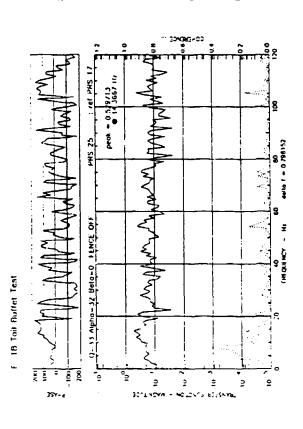


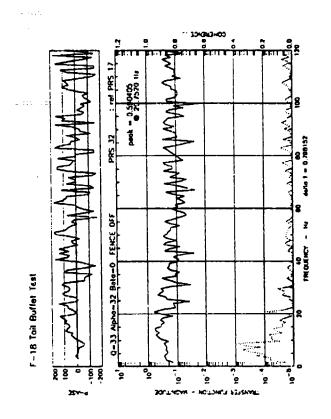


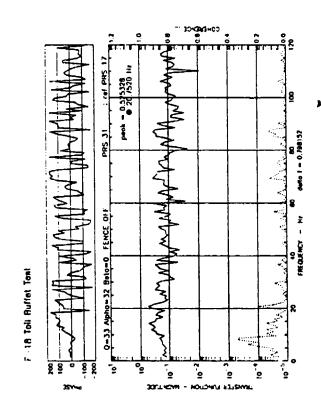


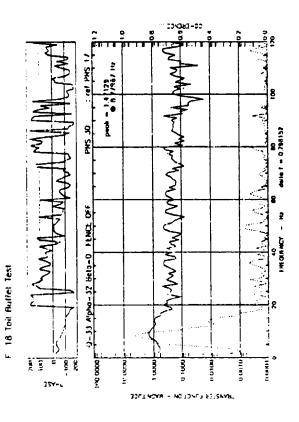


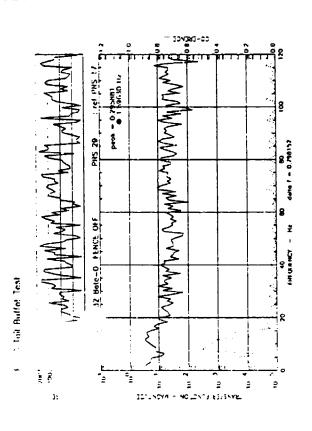


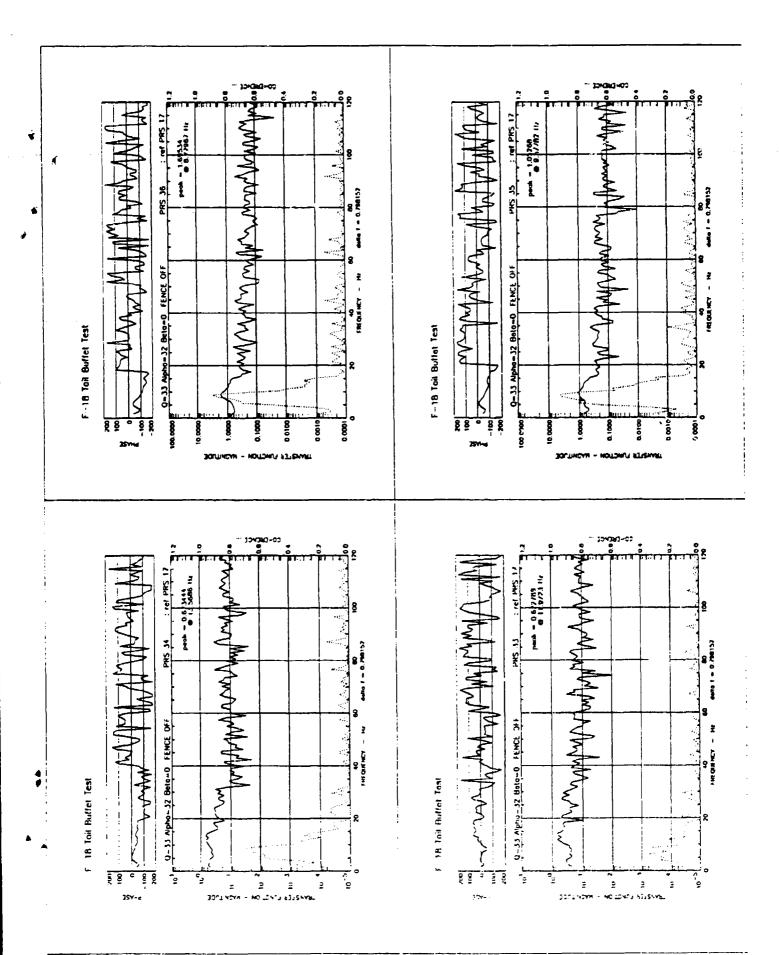


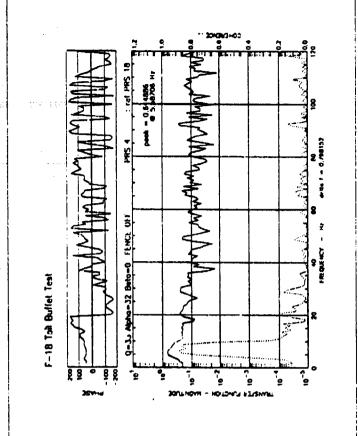


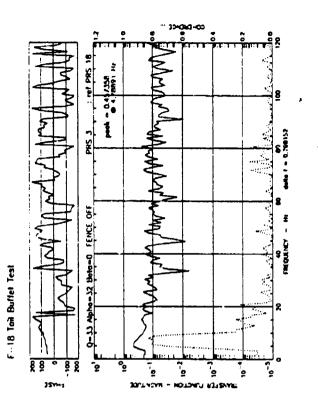


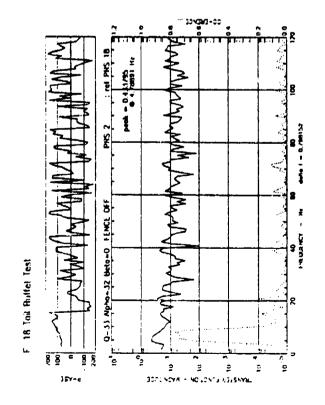


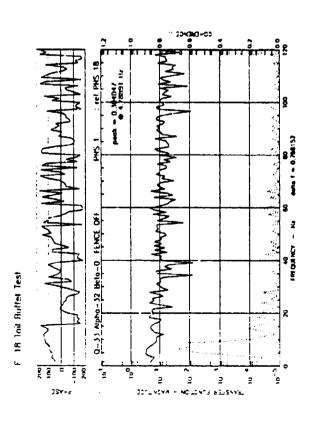


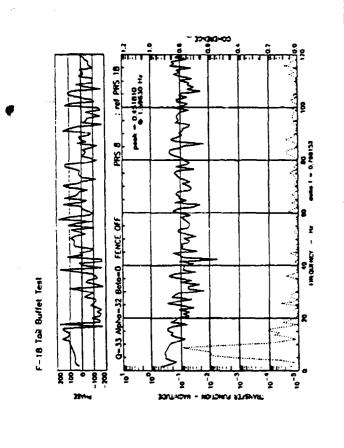


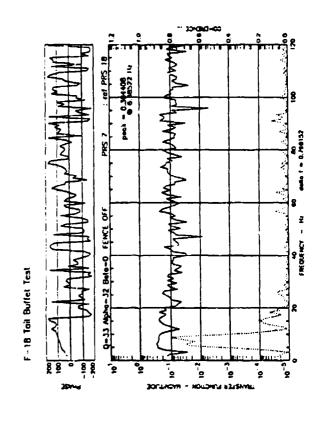


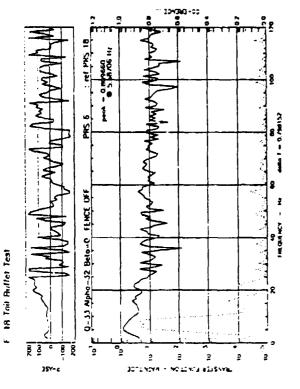


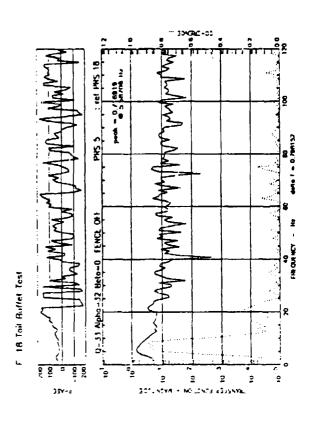


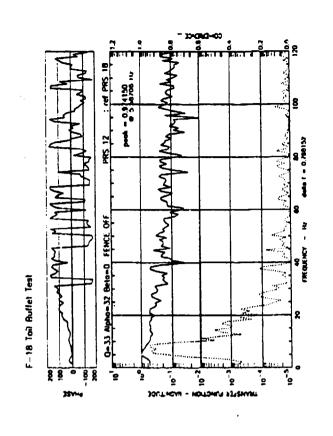


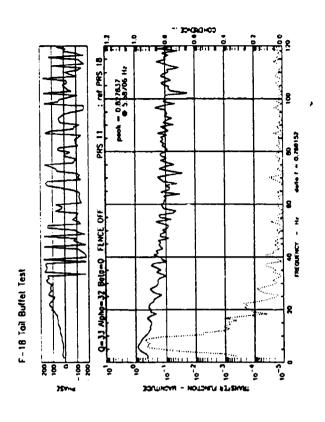


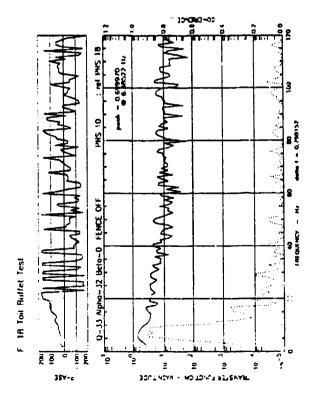


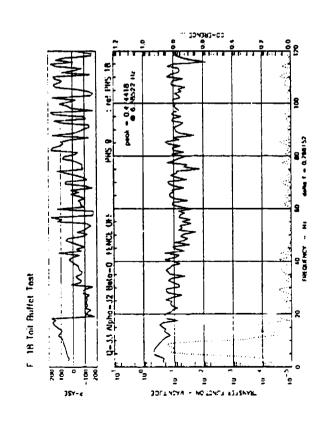


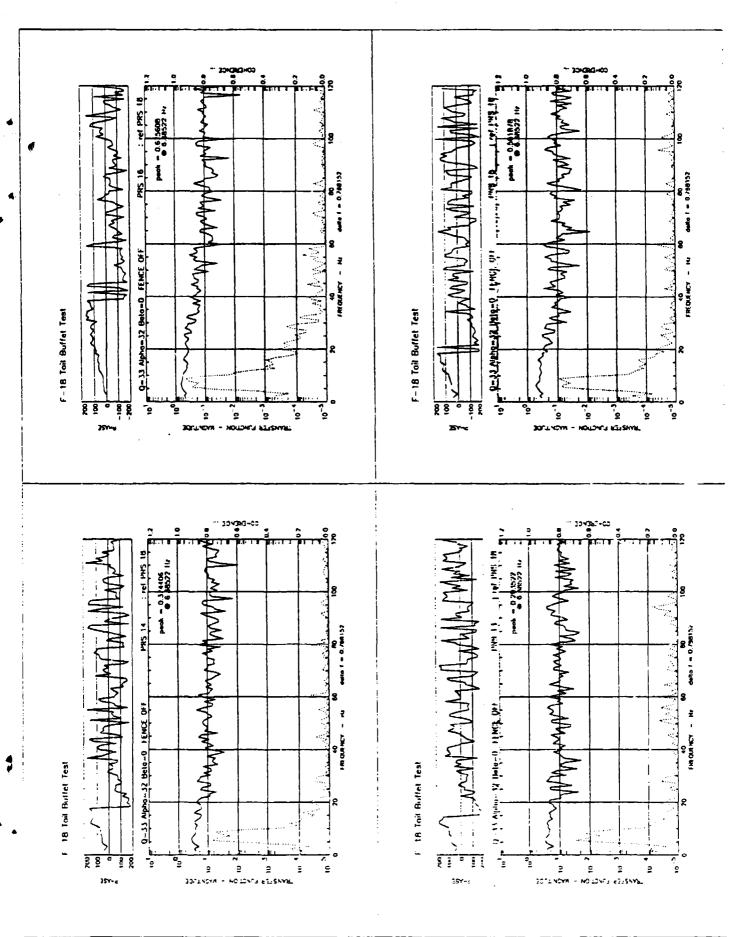


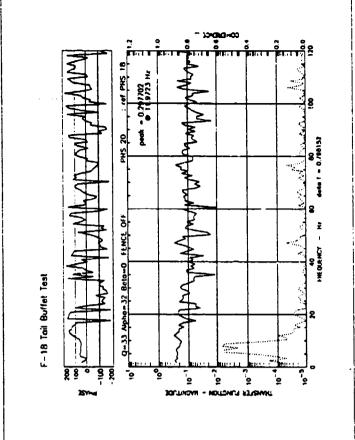


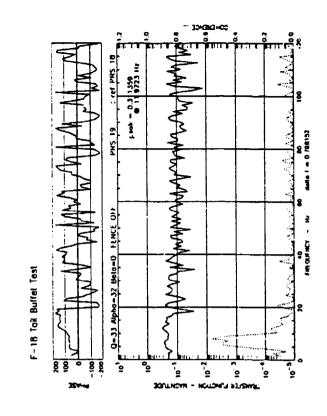


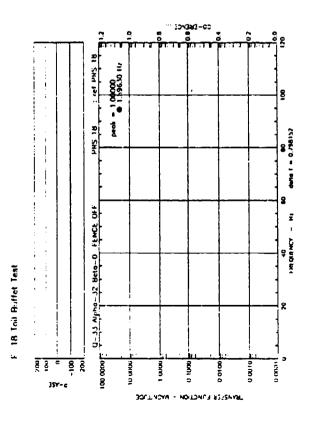


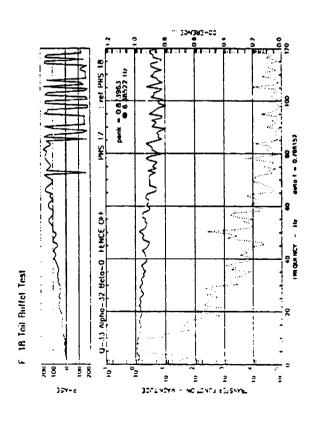


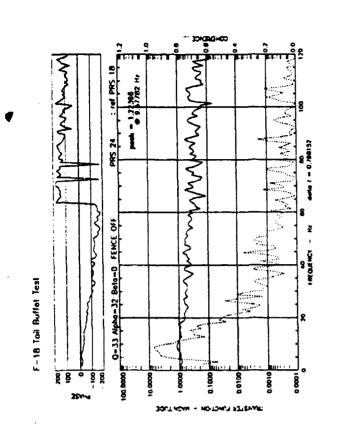


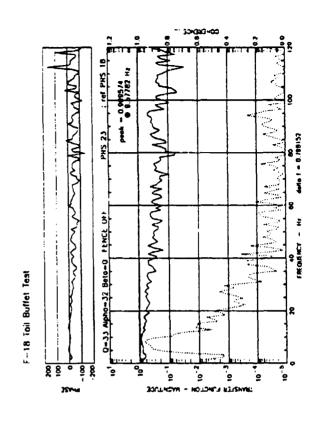


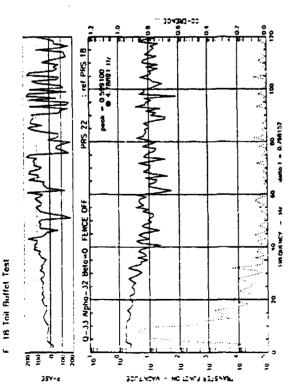


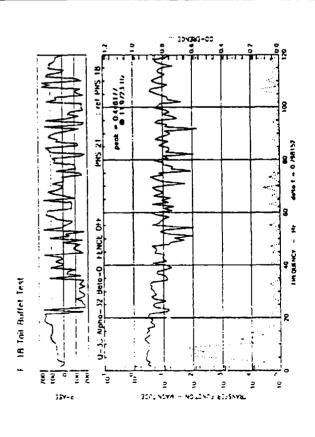


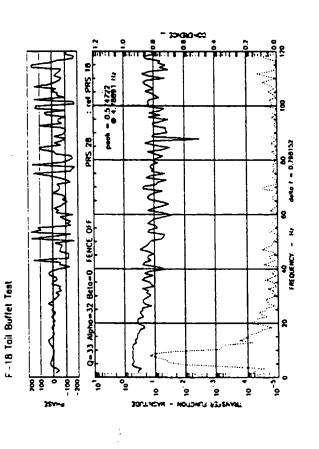


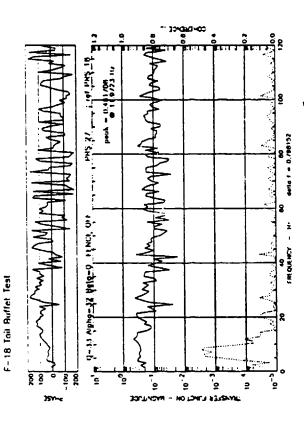


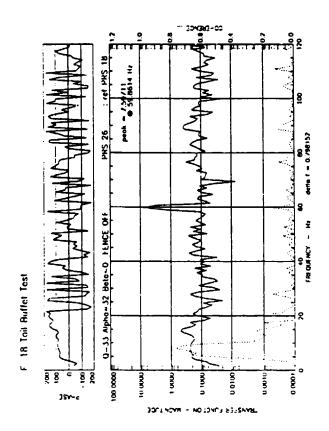


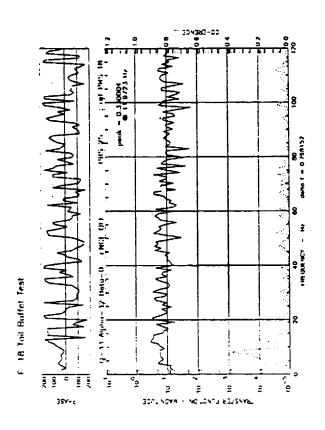


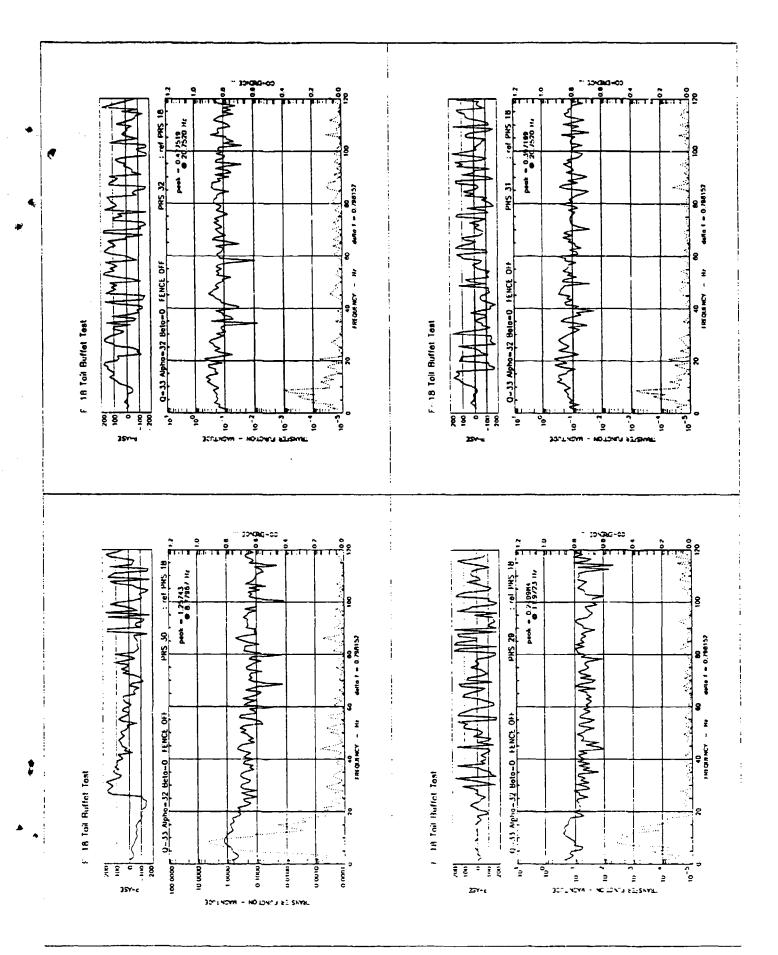


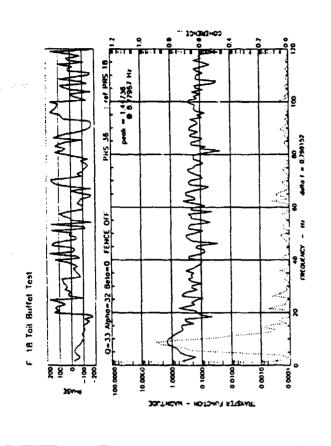


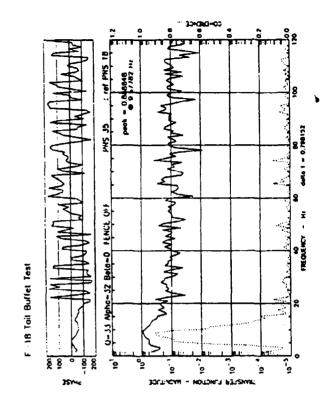


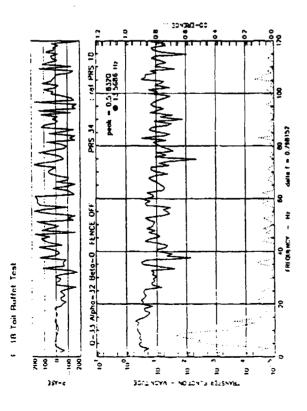


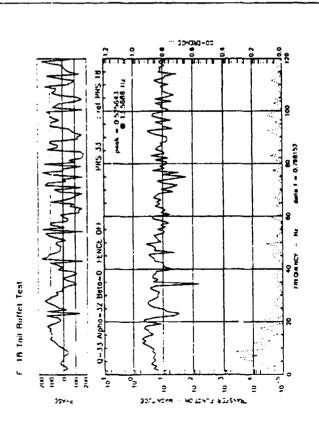


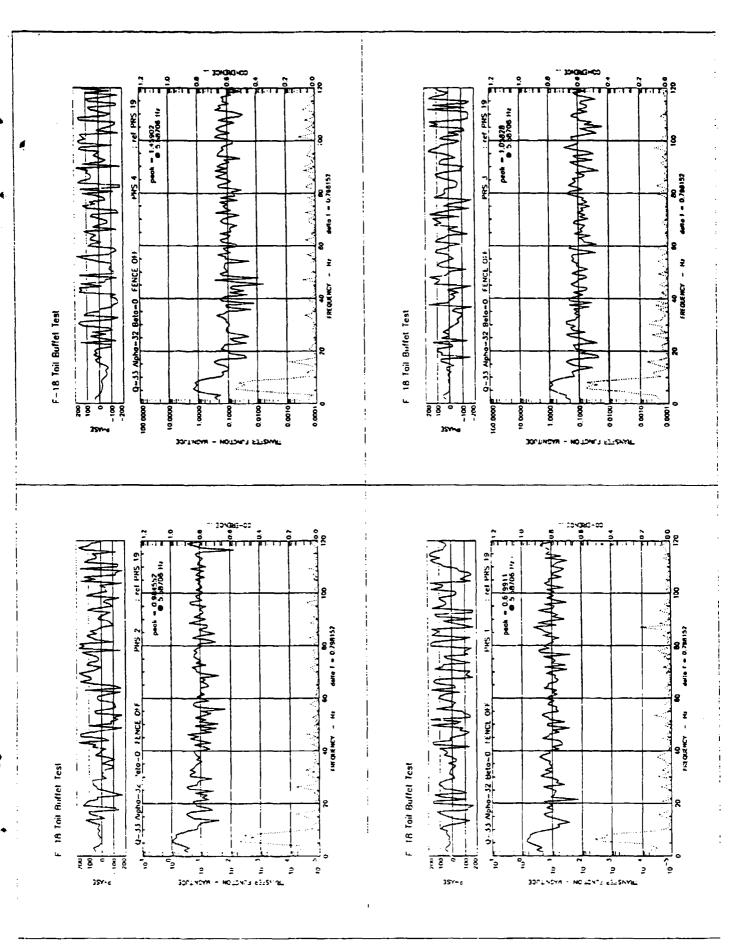


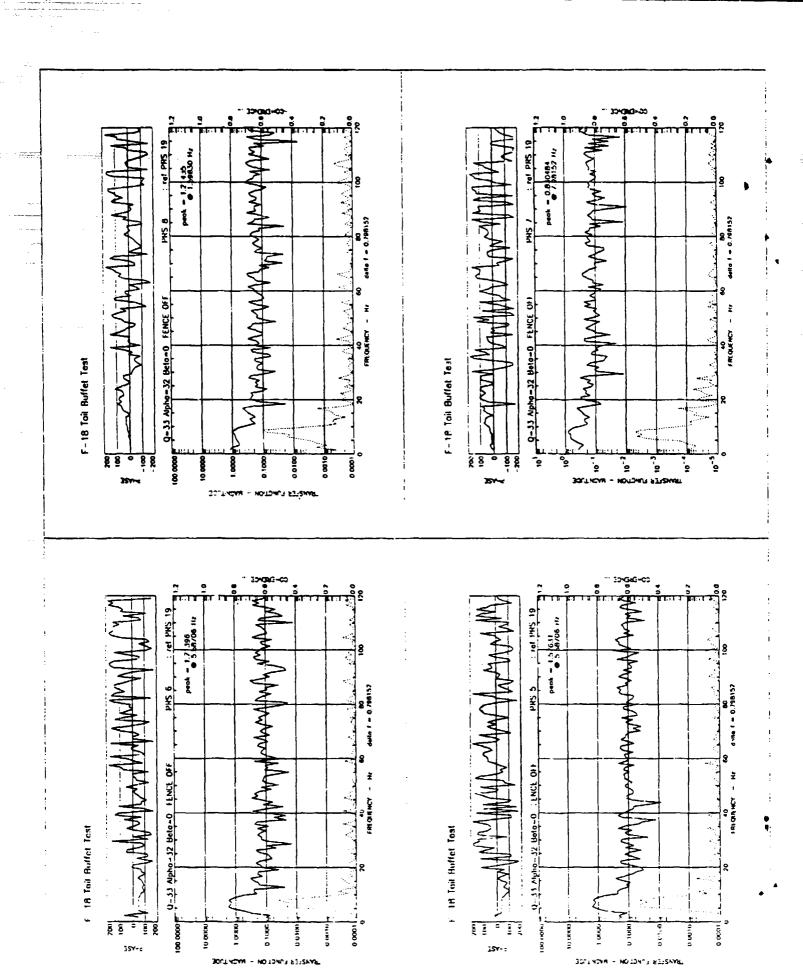


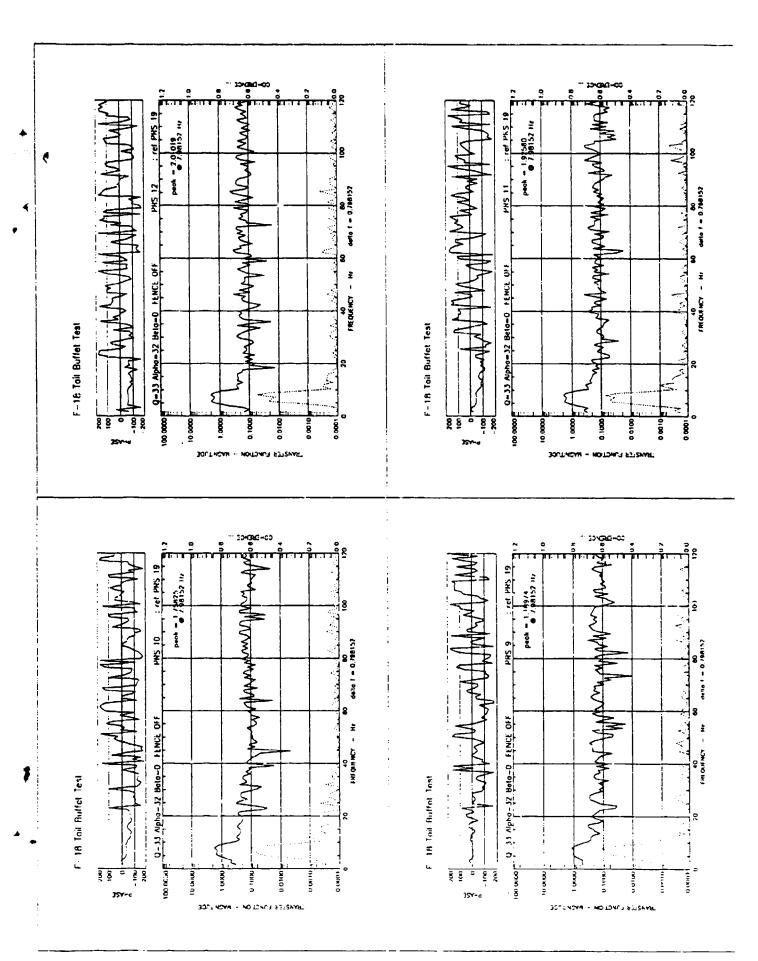


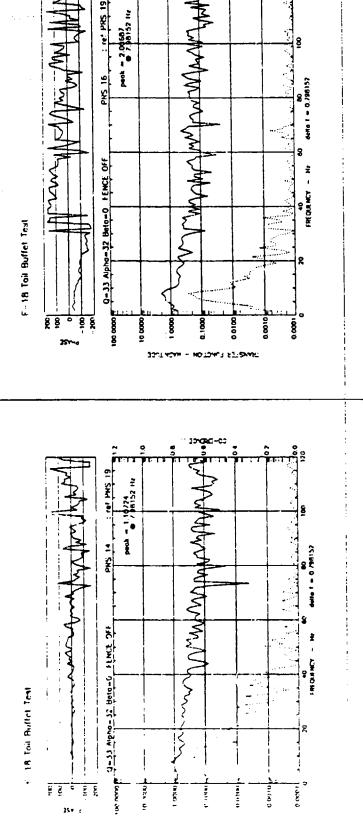






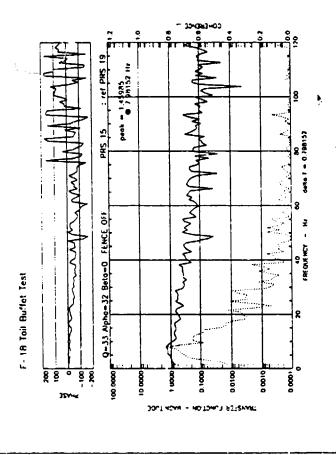


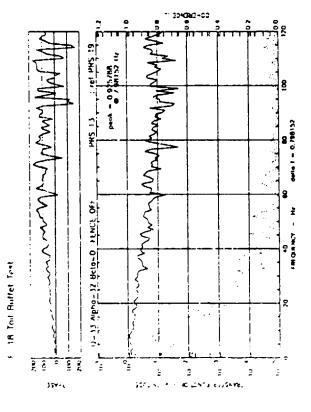


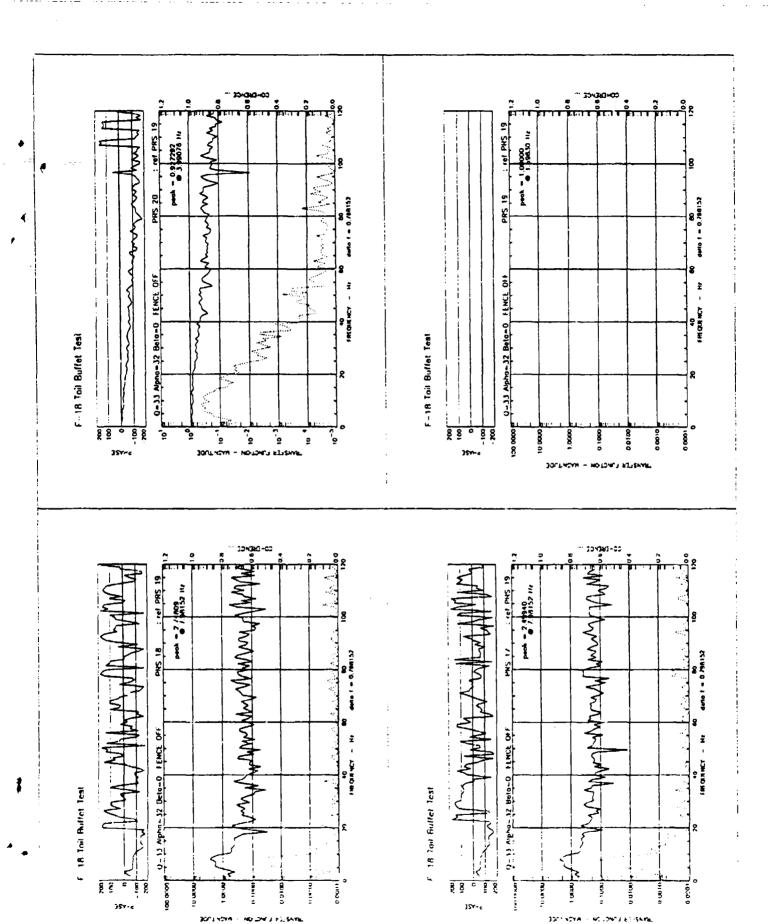


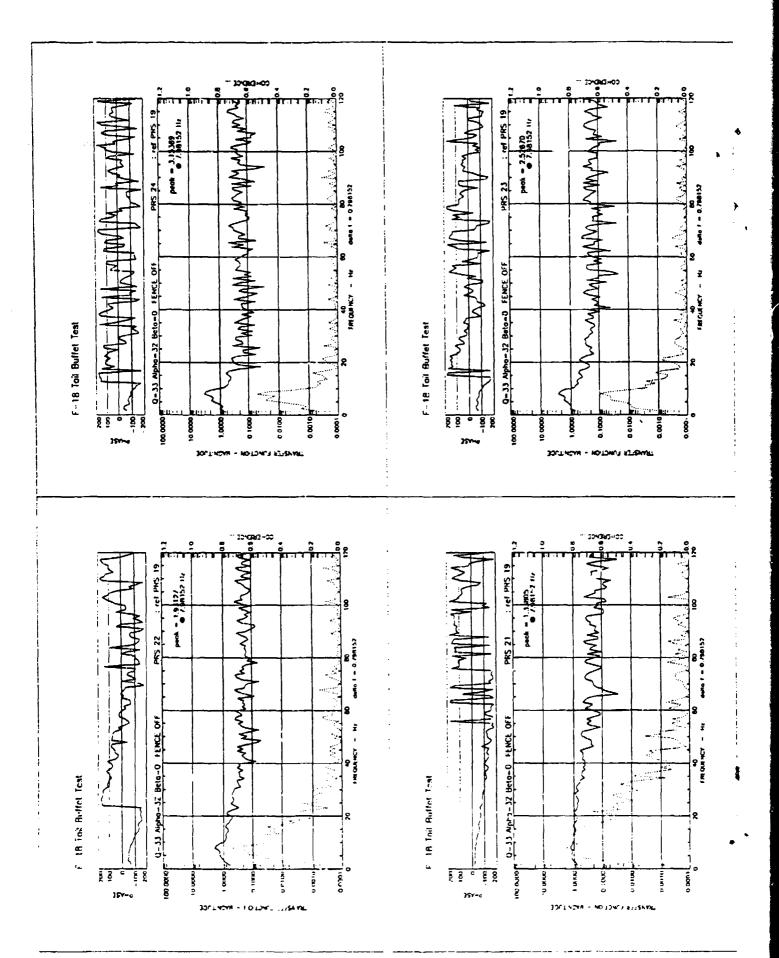
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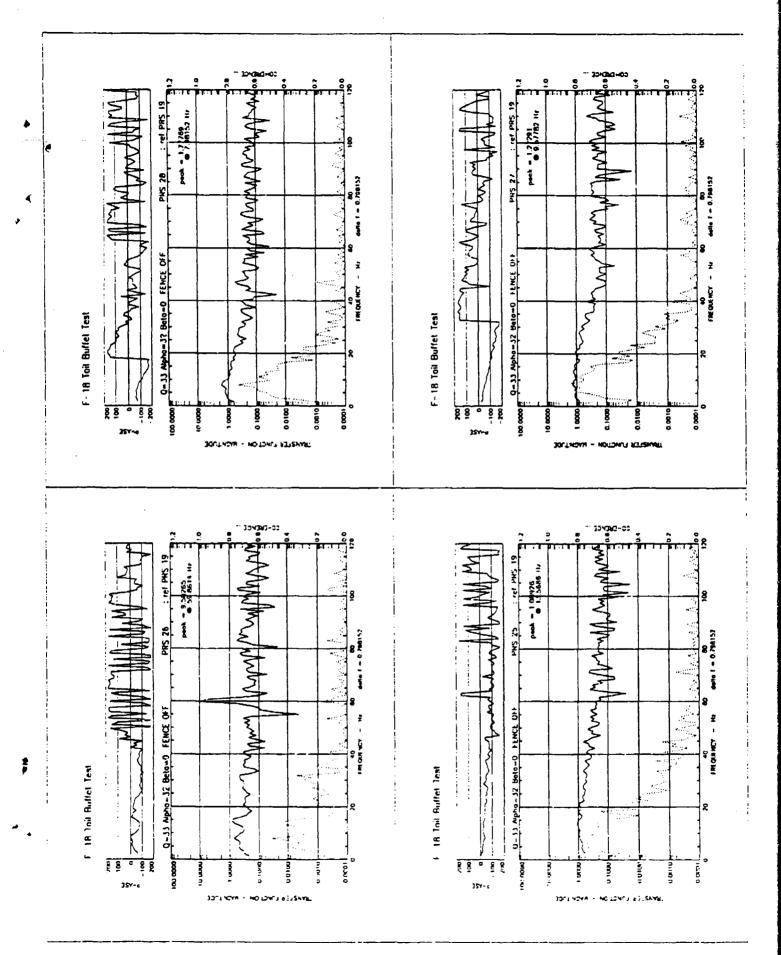
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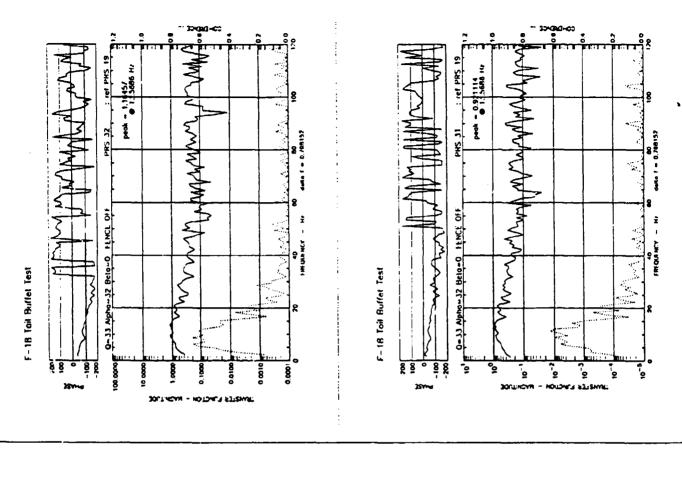


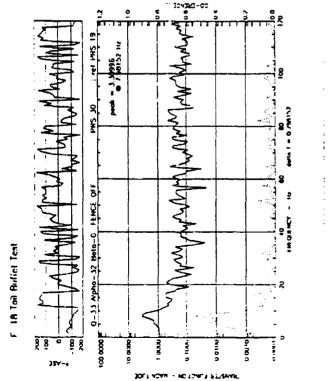


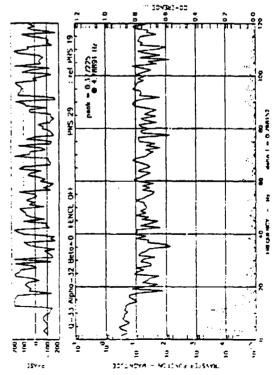




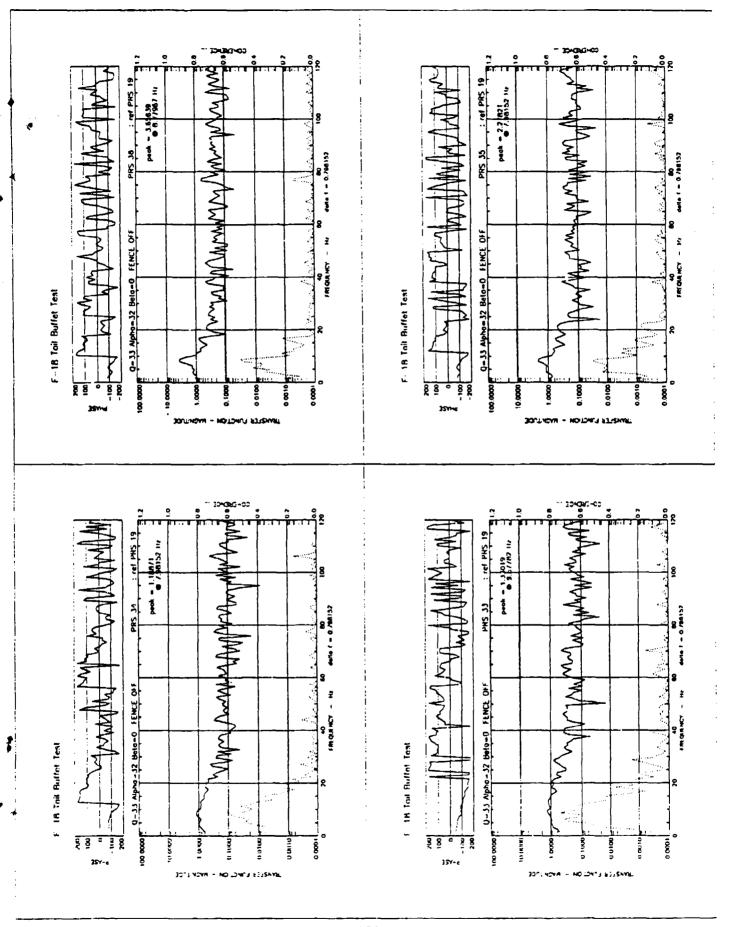


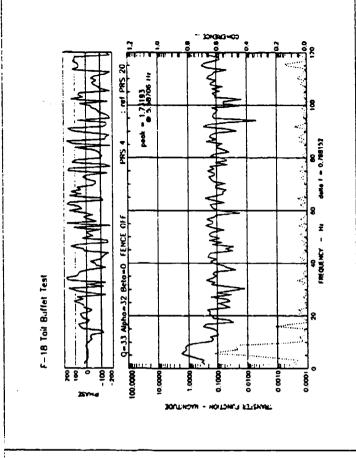


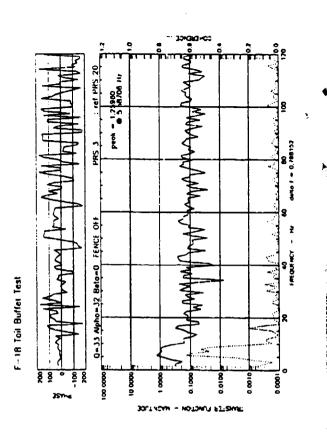


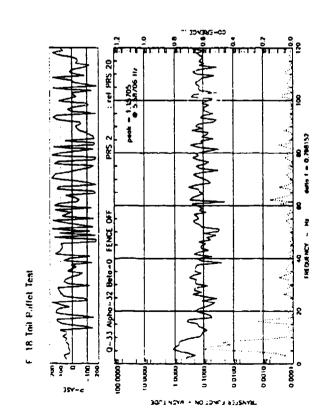


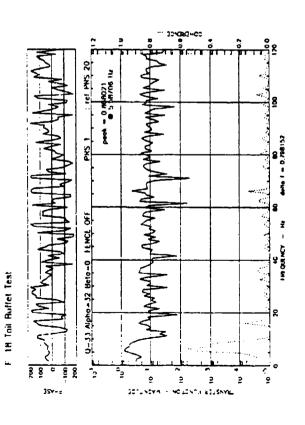
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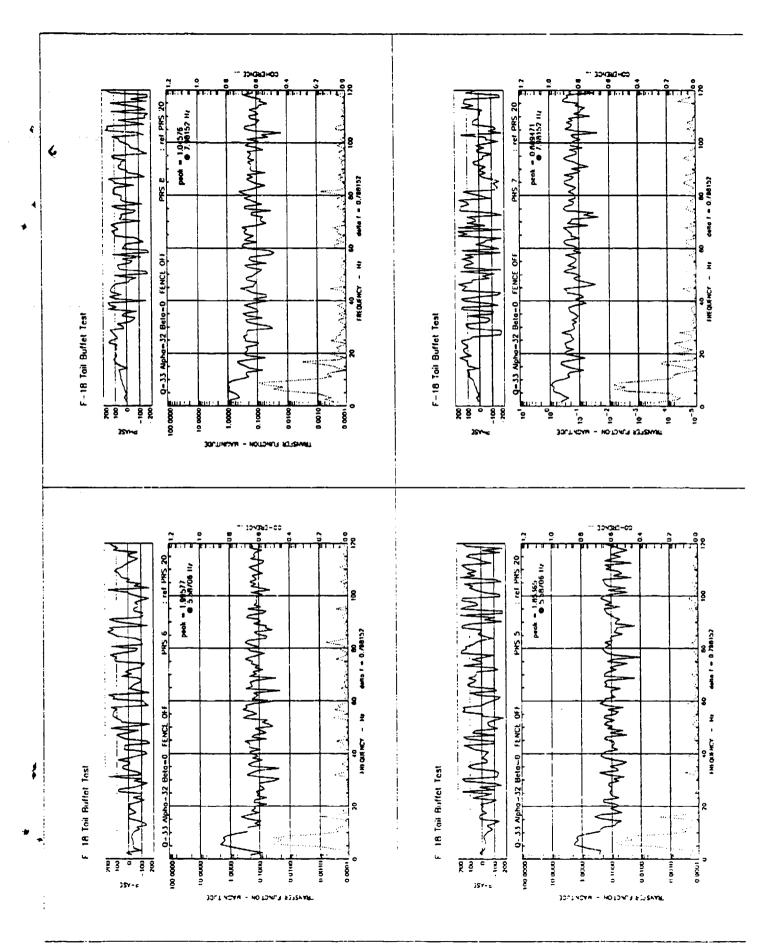


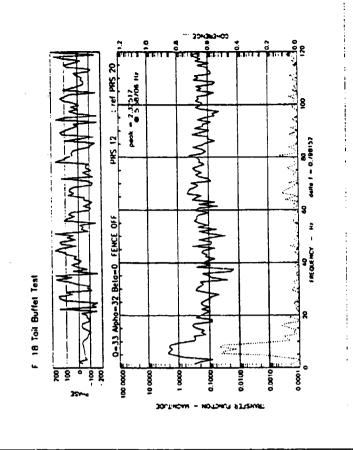


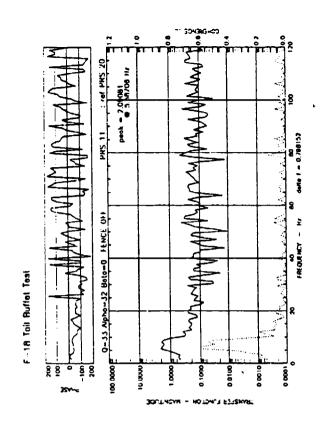


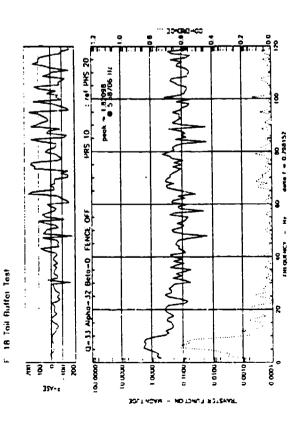


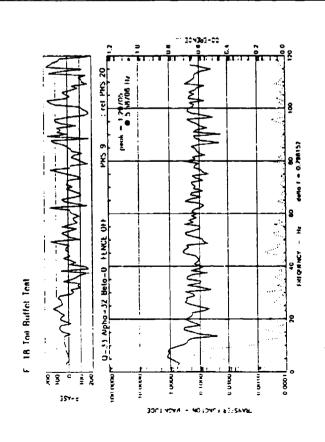


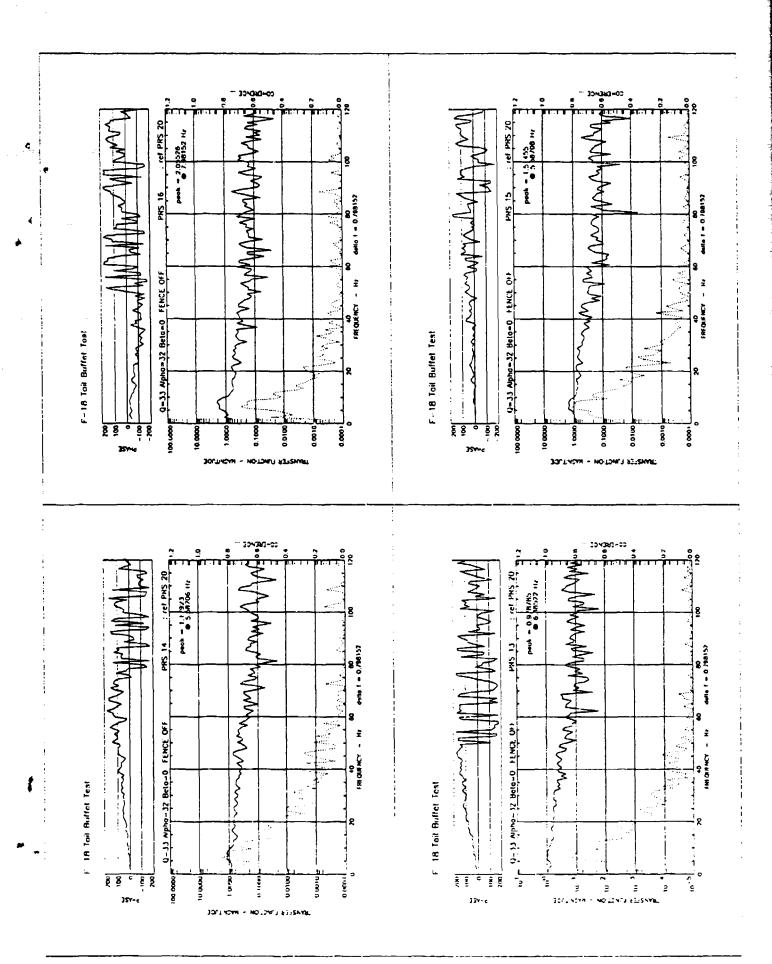


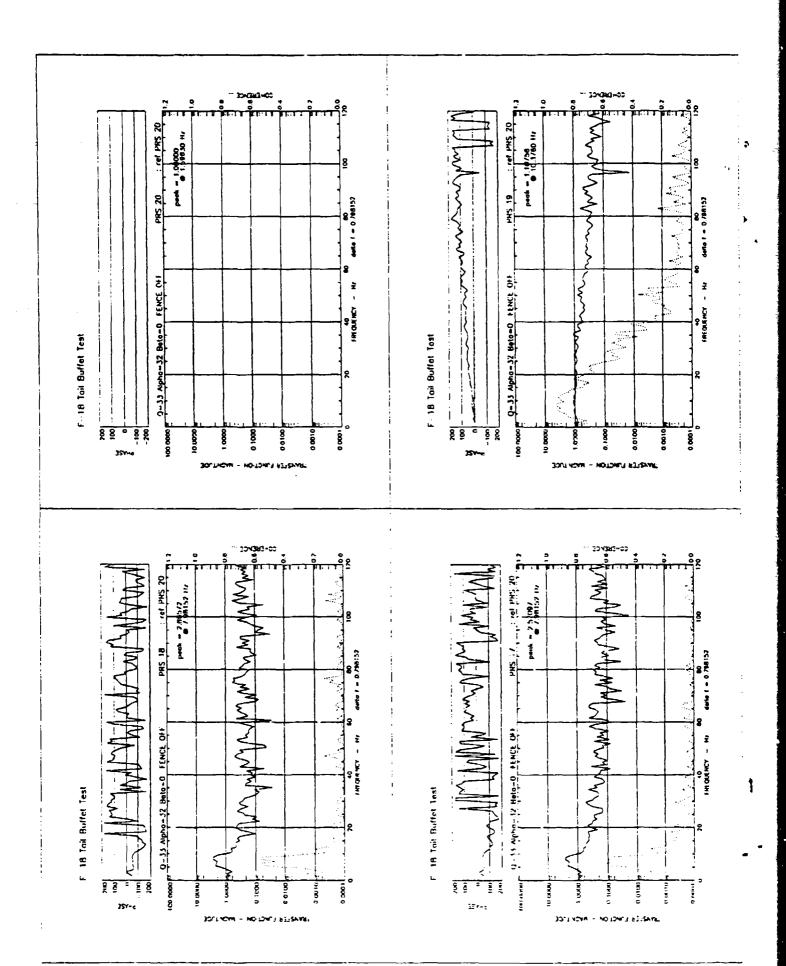


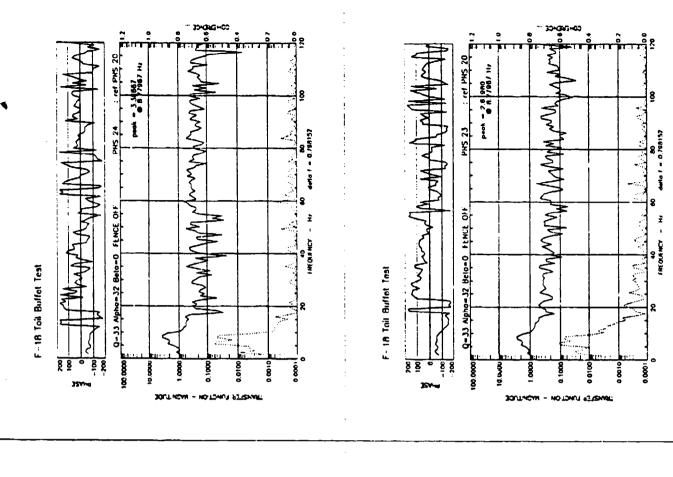


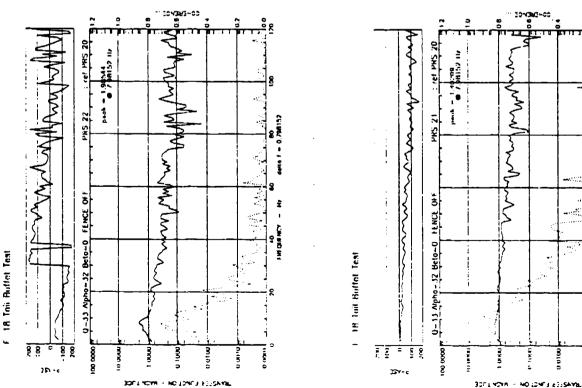


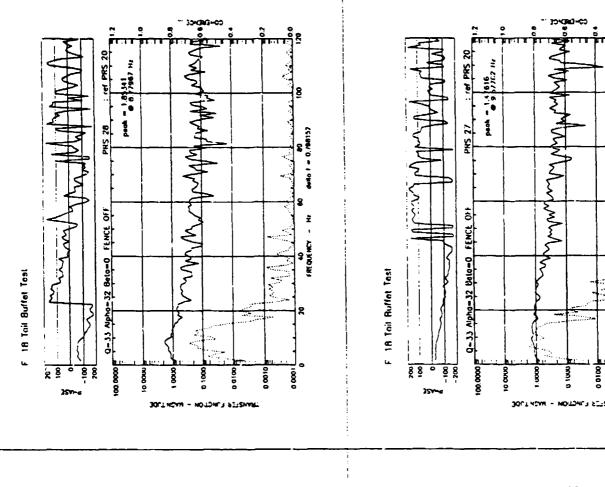


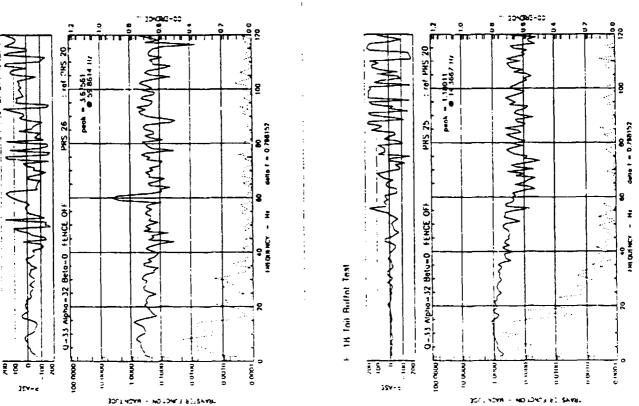




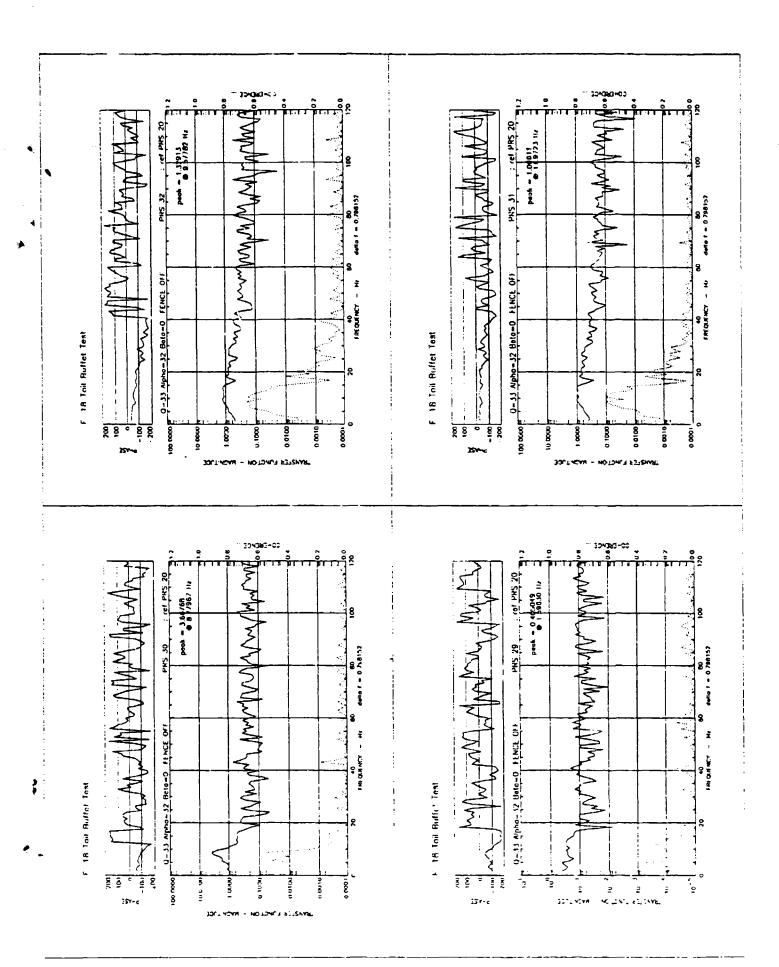


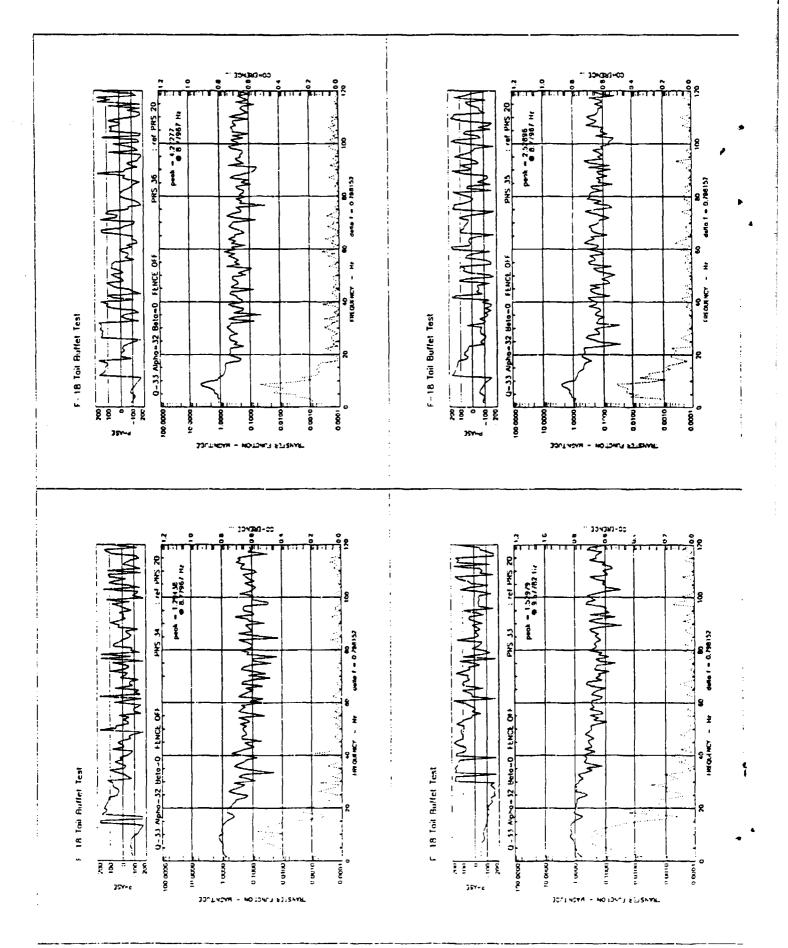


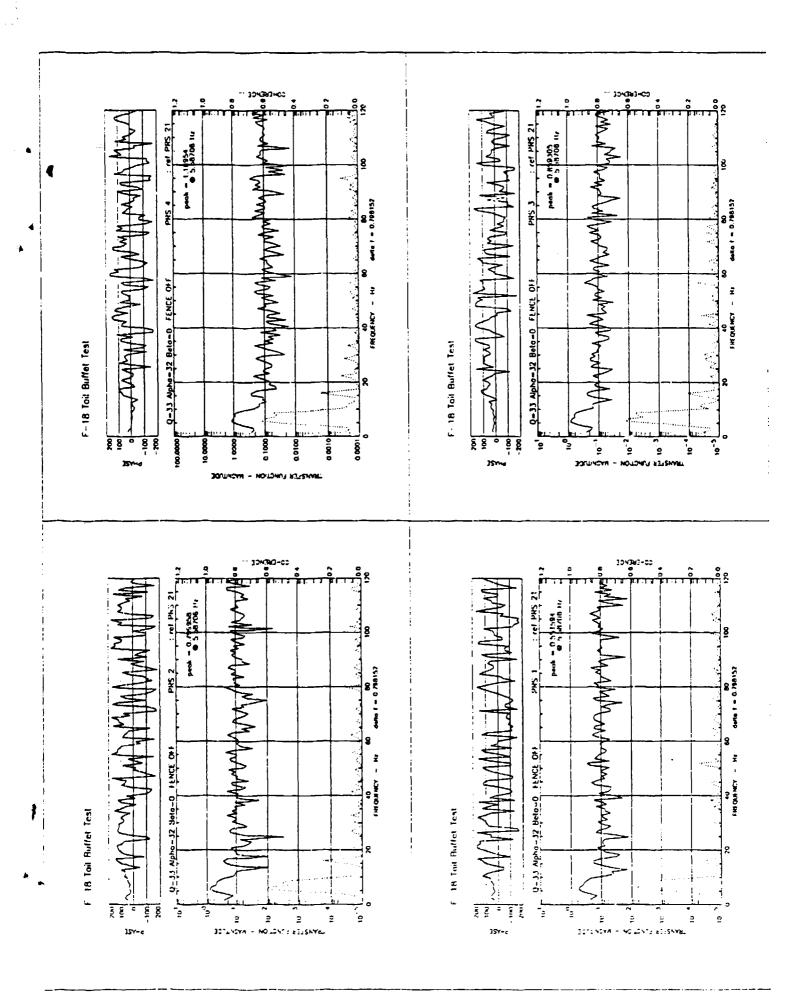


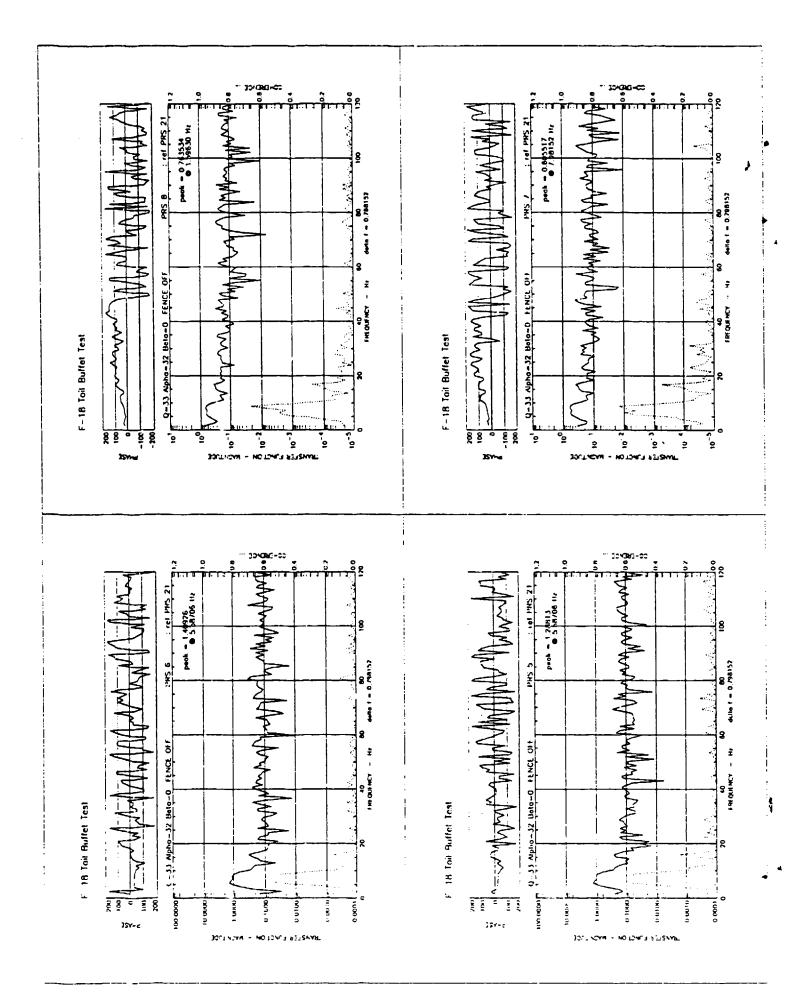


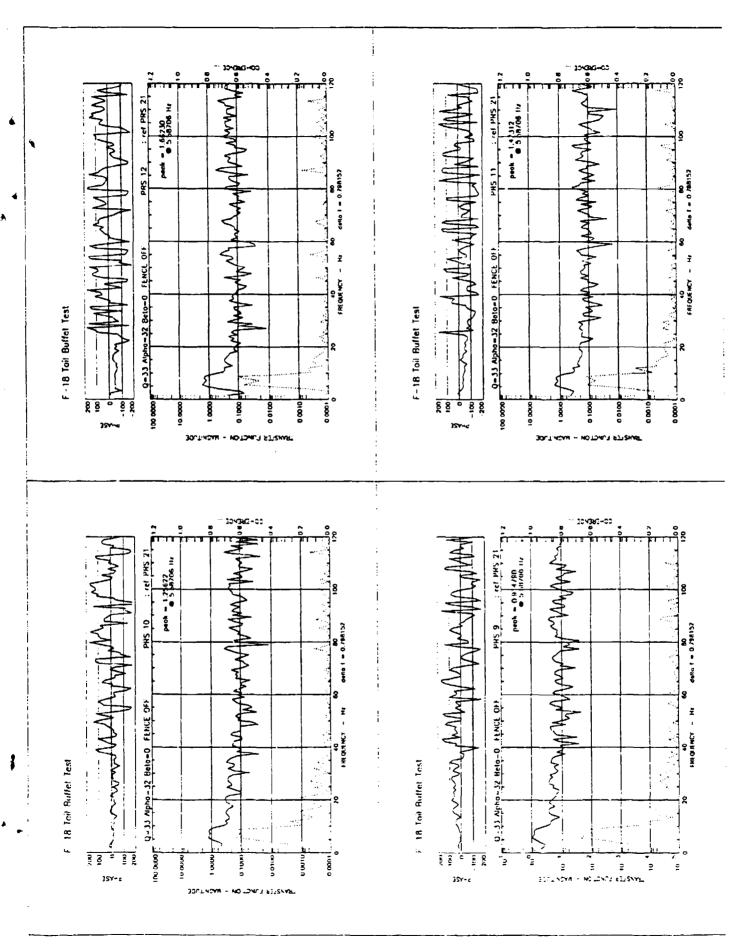
18 Tail Huffet Test

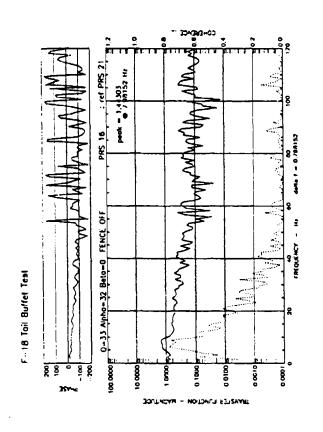


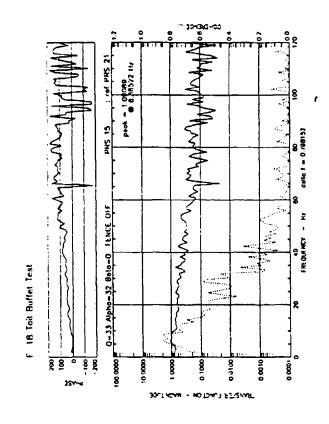


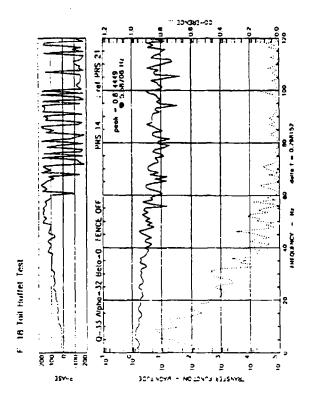


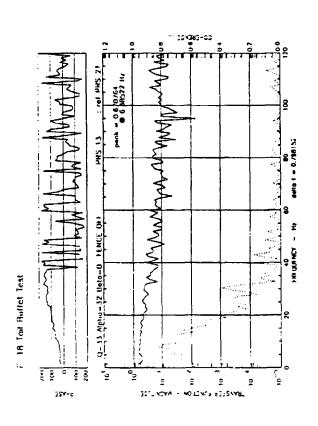


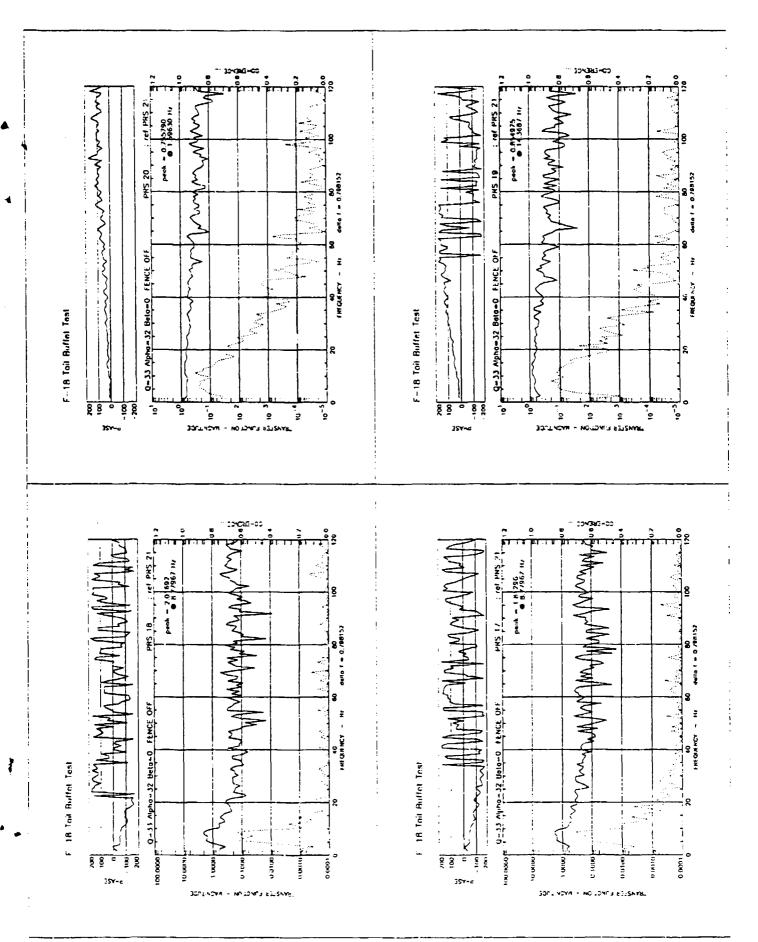


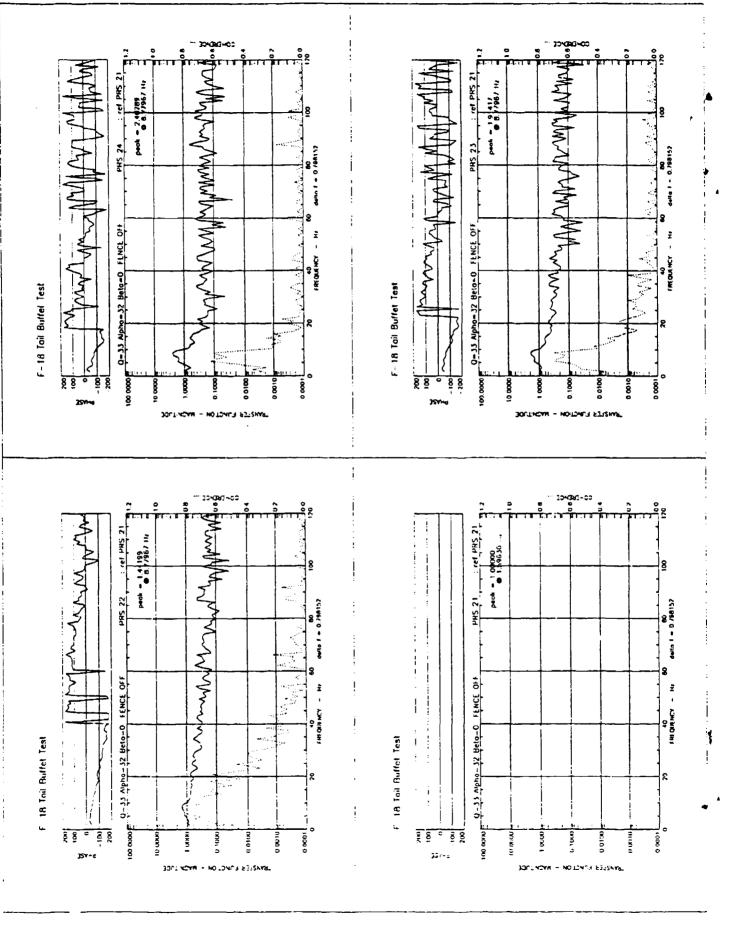


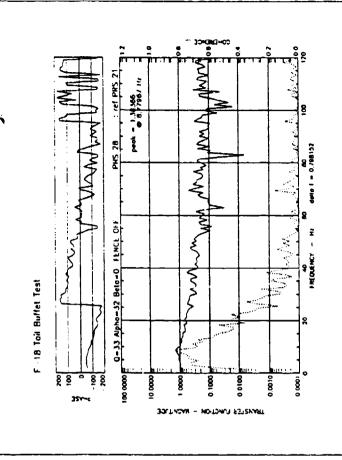


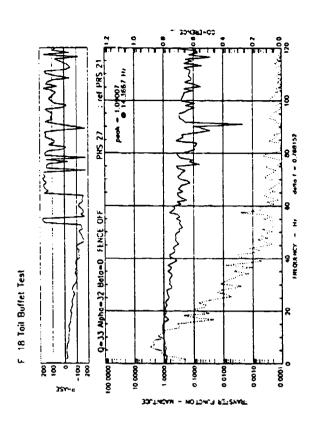


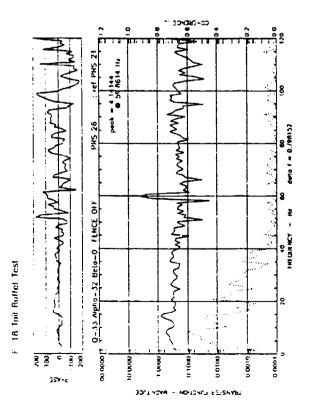


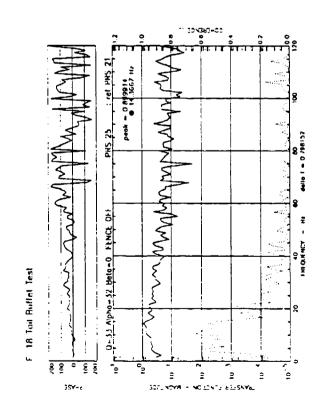


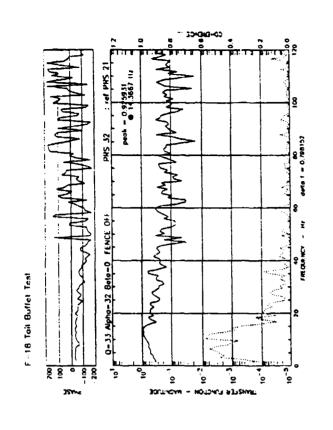


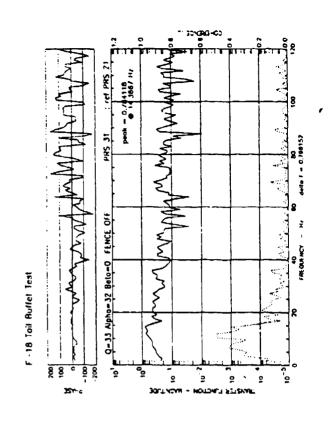


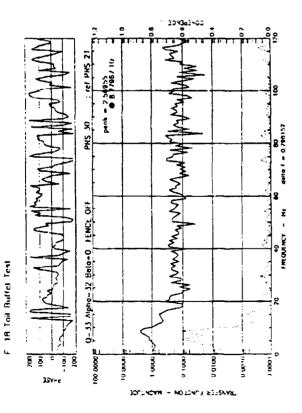


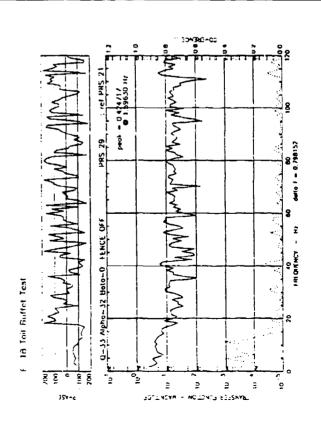


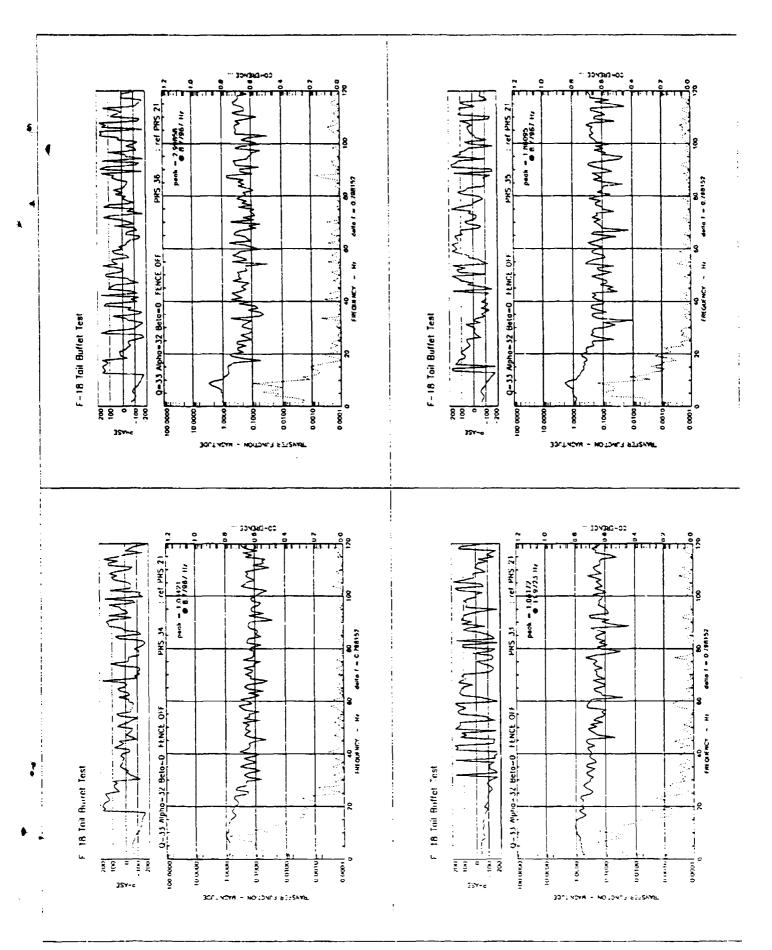


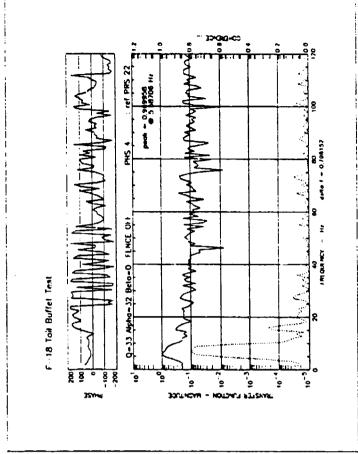


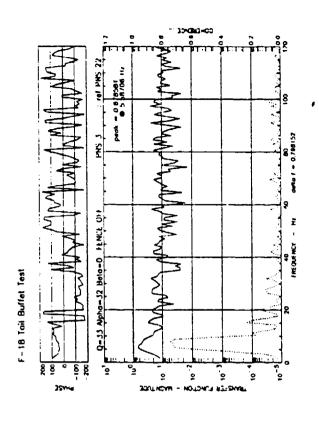


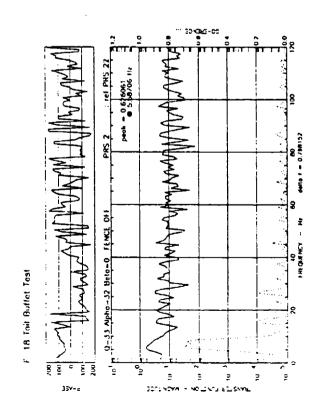


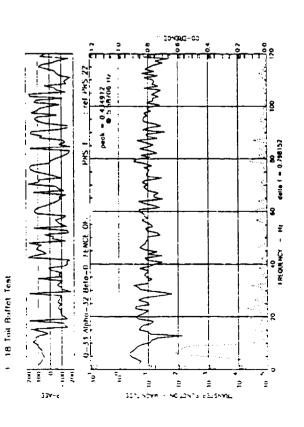


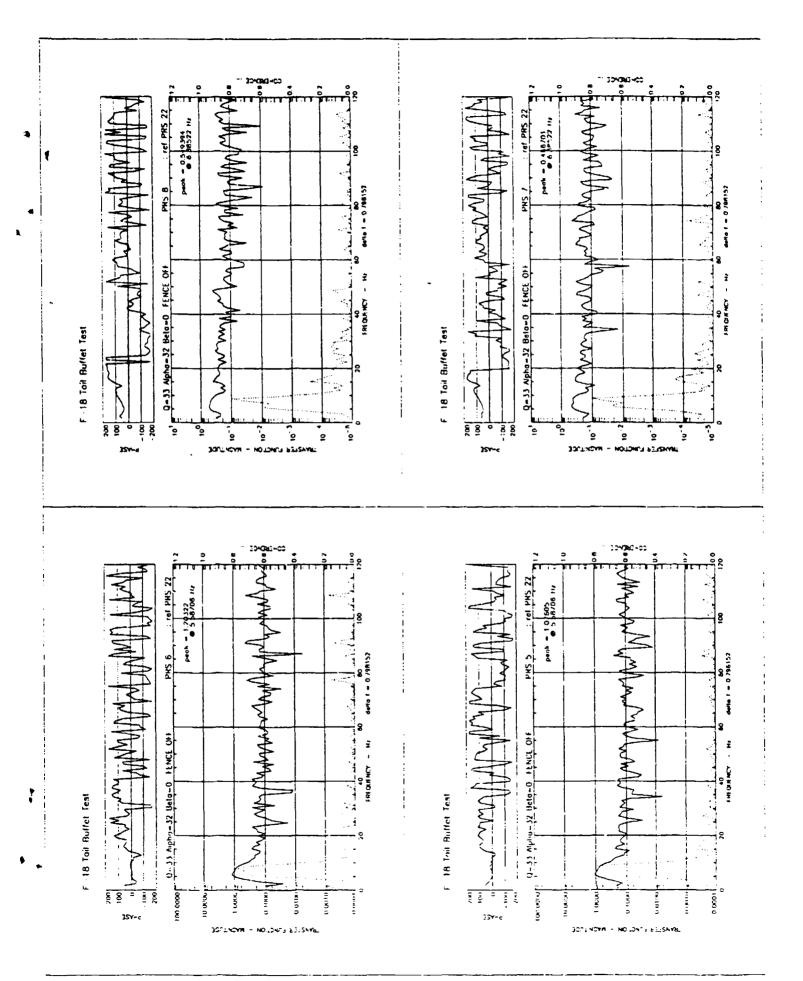


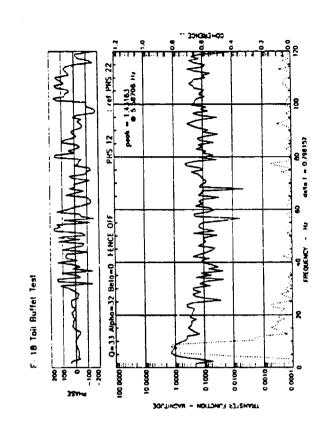


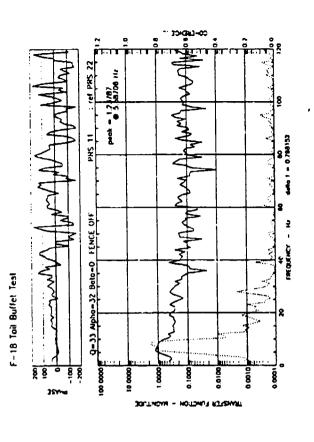


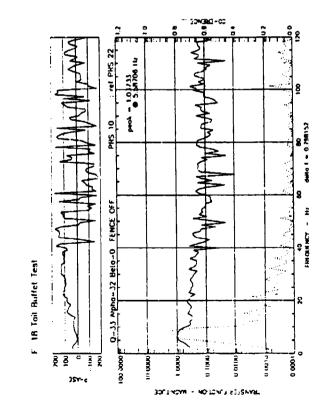


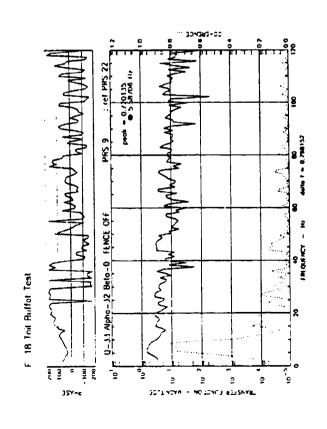


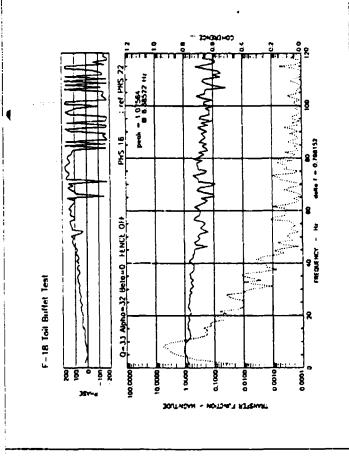


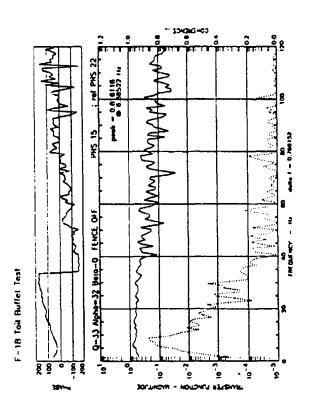


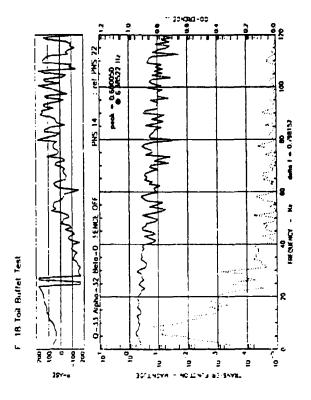


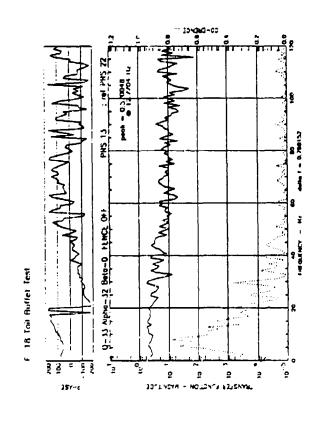


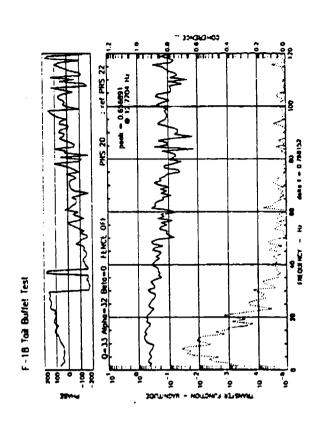


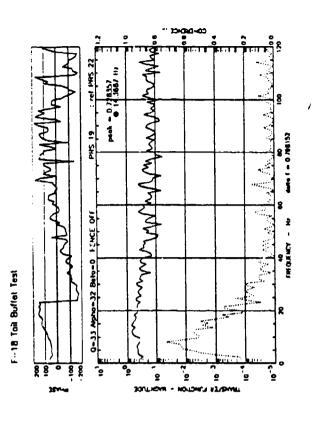


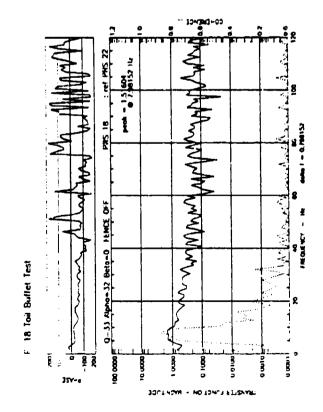


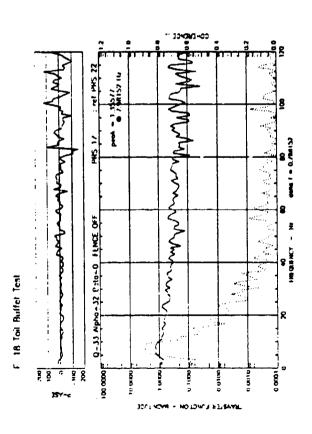


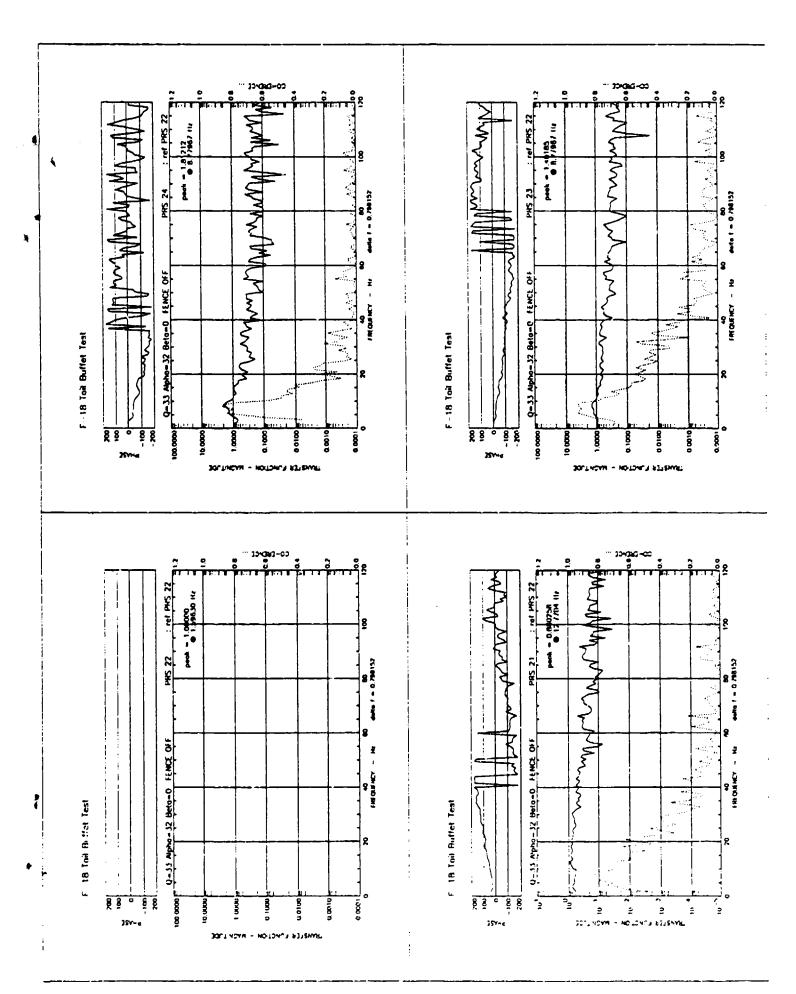


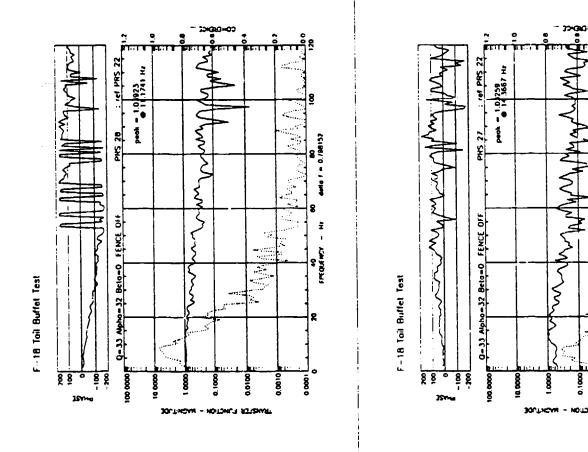


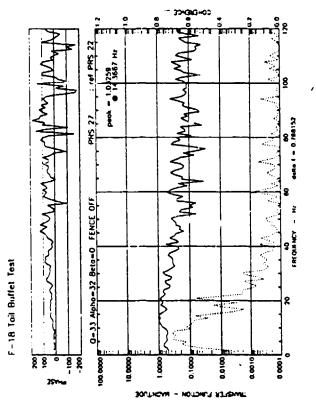


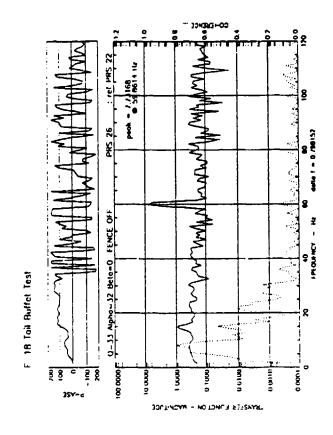


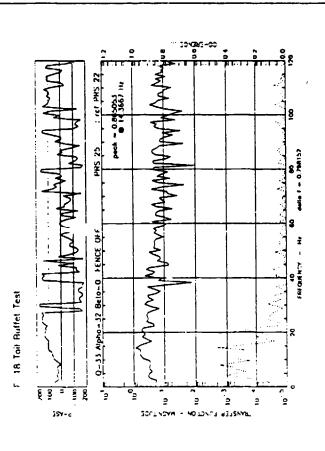


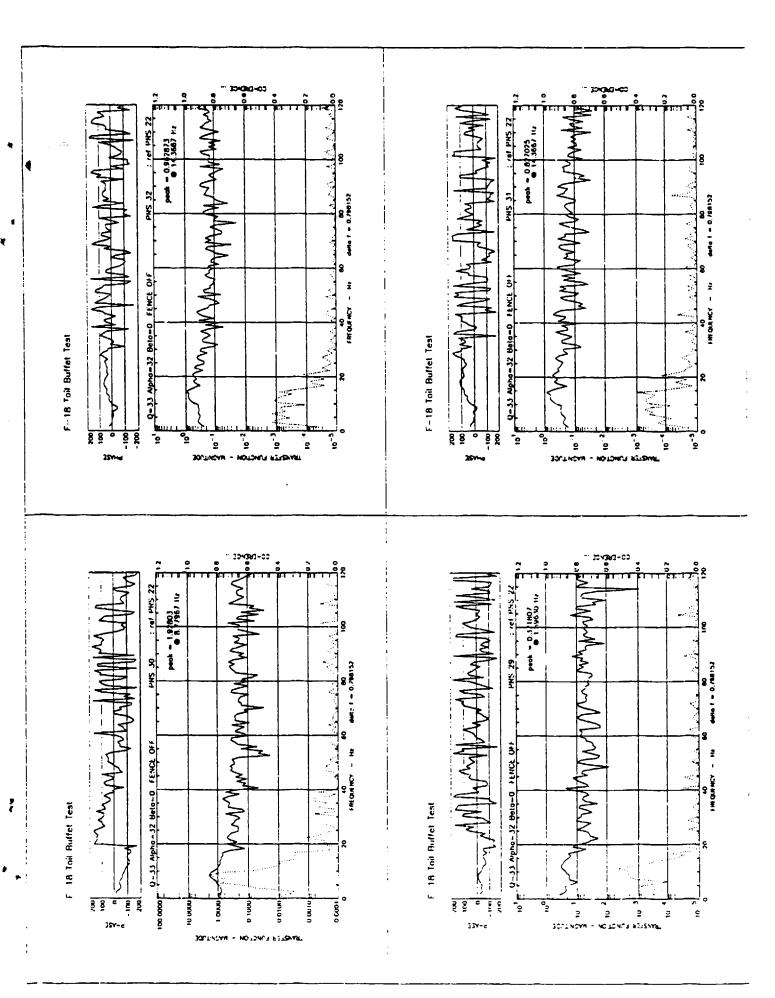


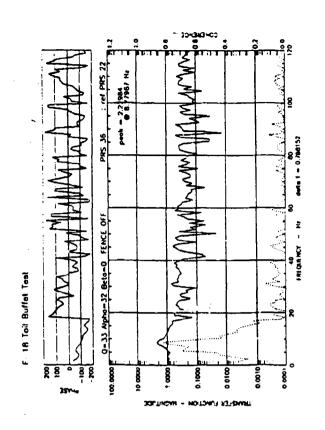


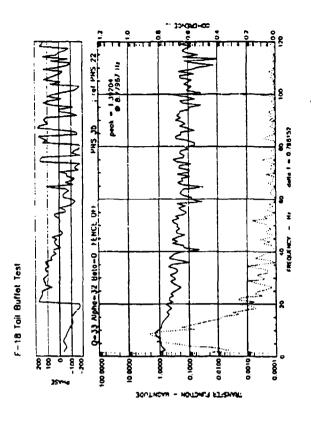


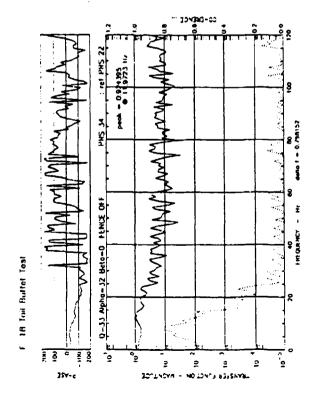


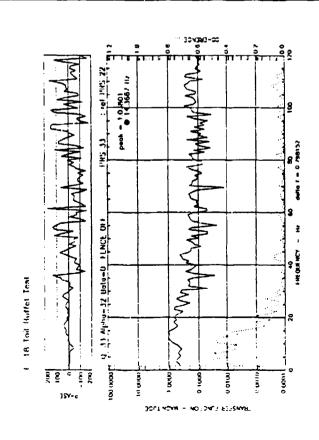


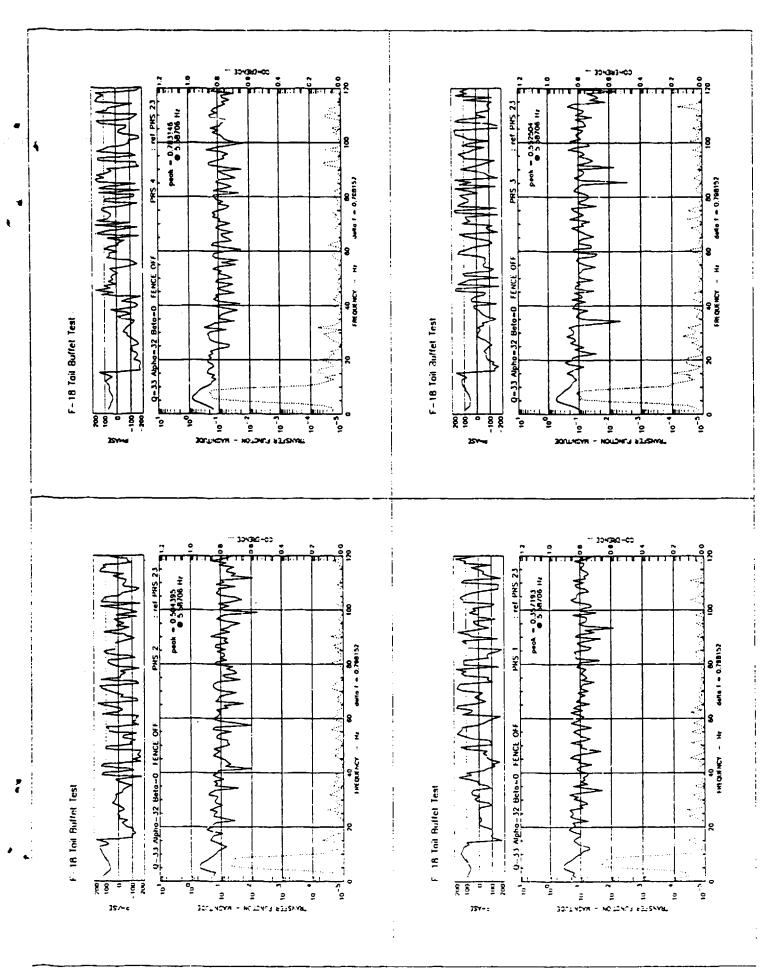


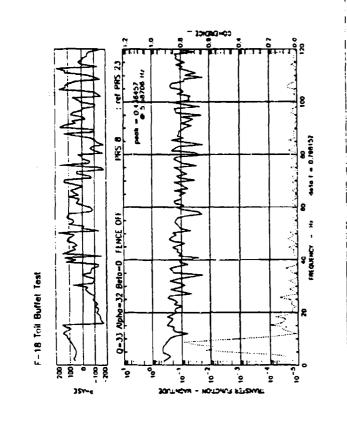


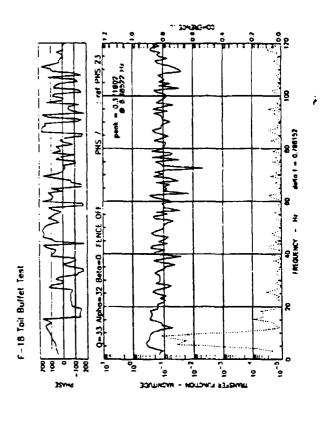


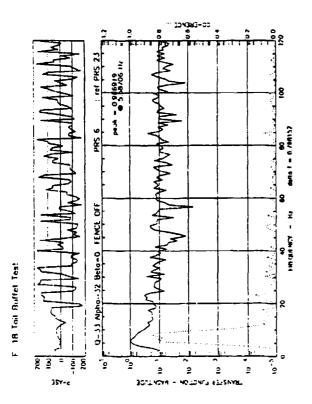


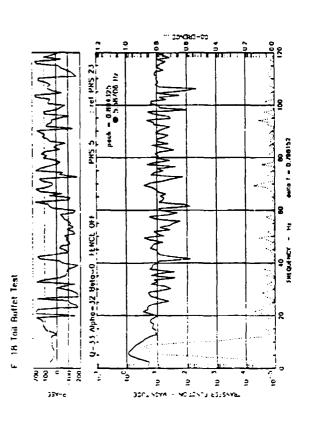


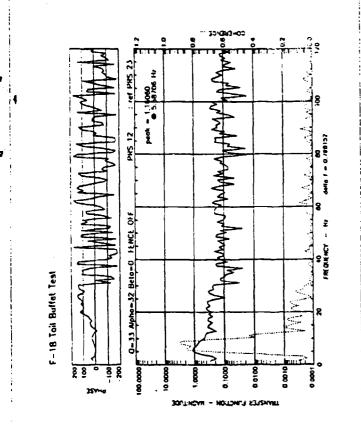


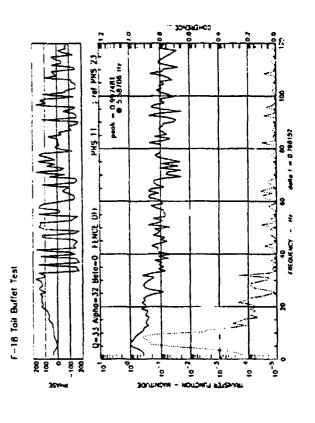


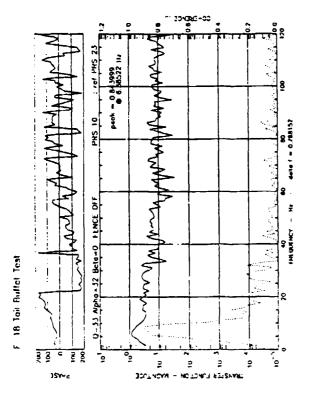


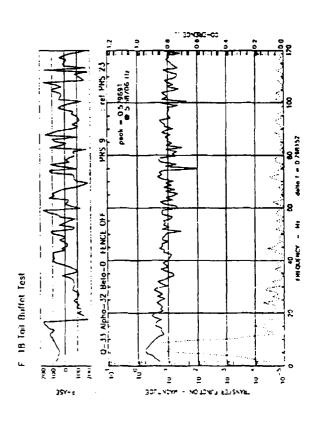


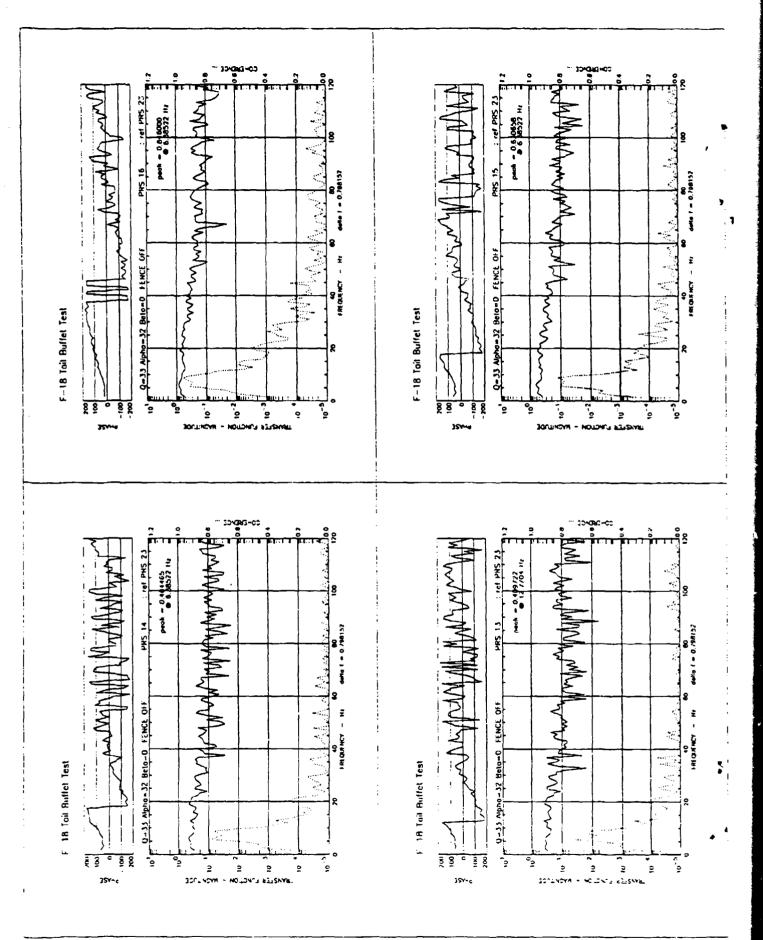


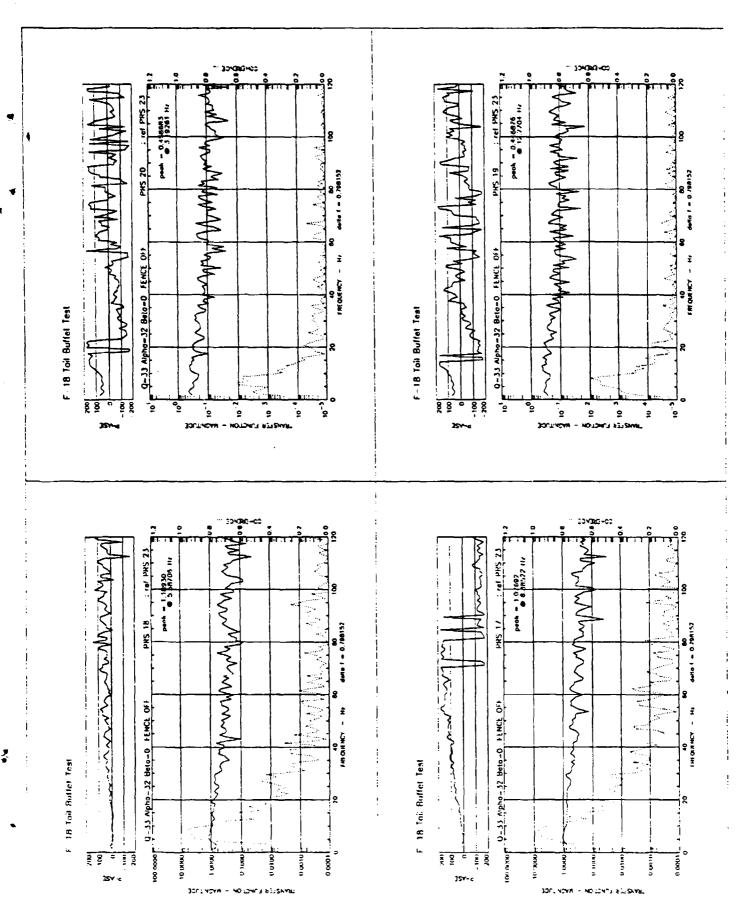


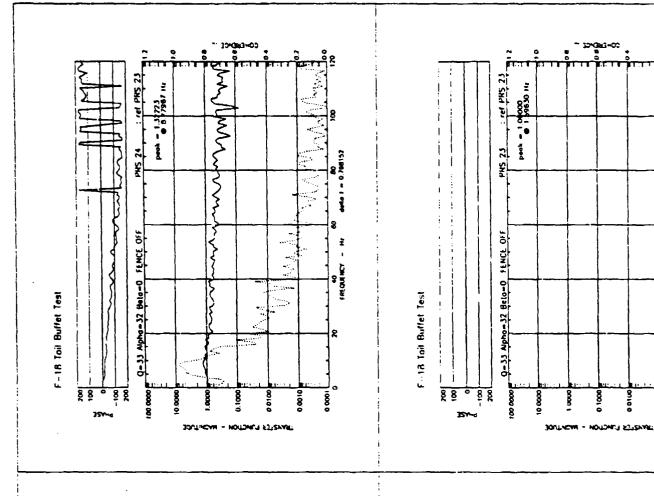


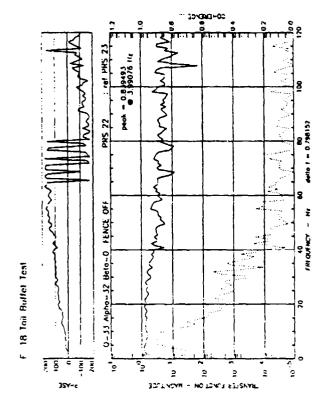


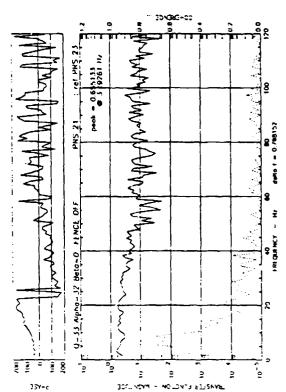






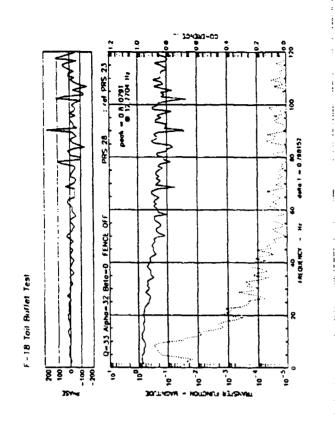


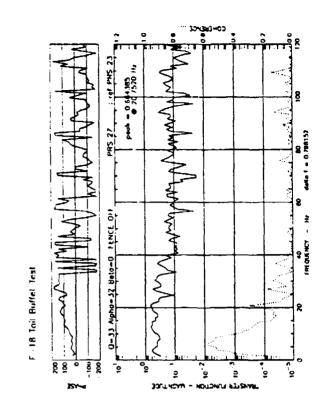


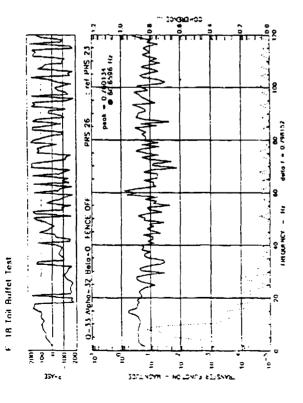


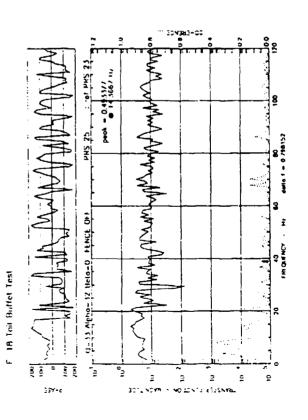
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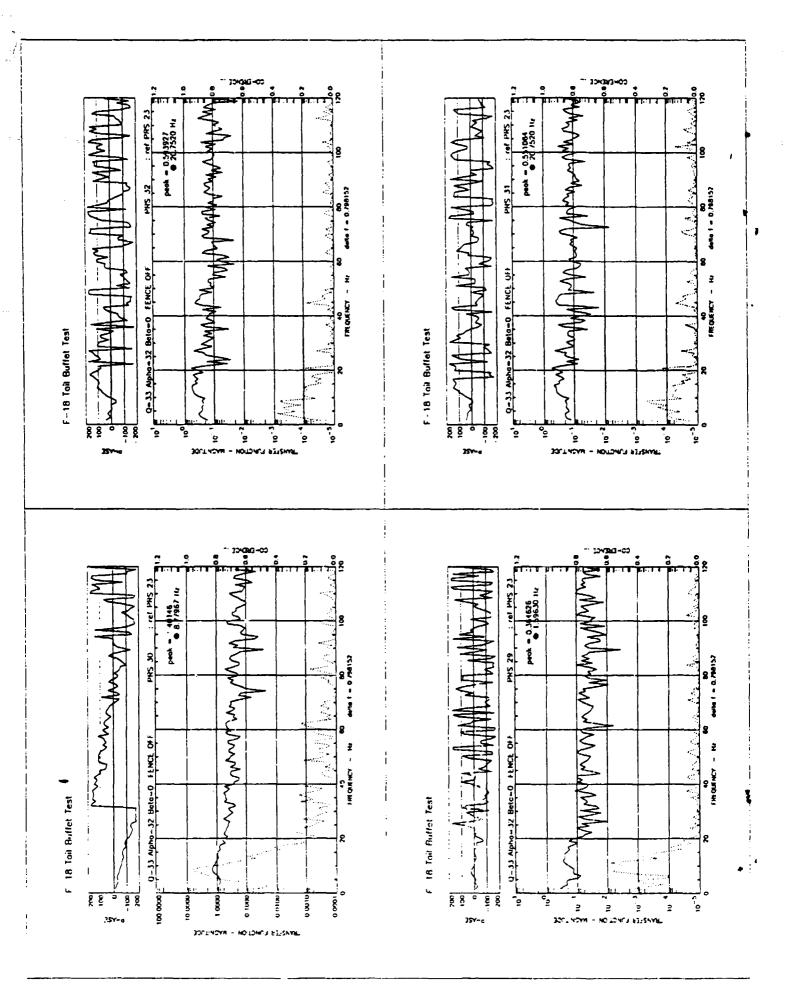
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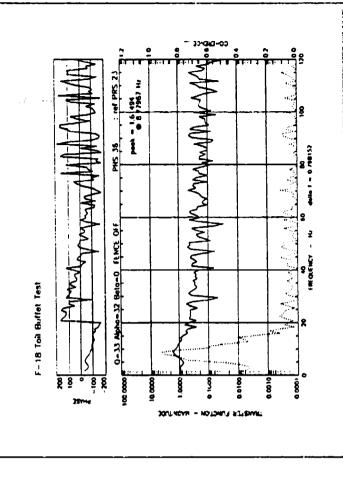


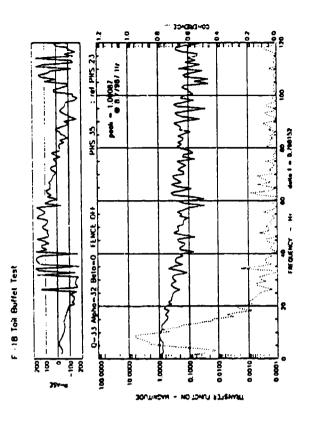


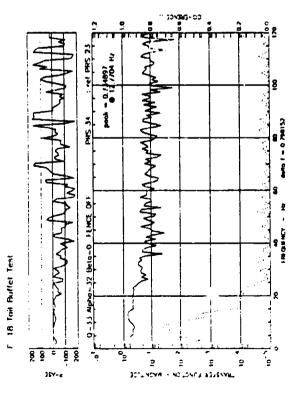


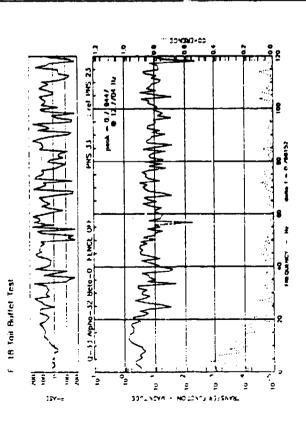


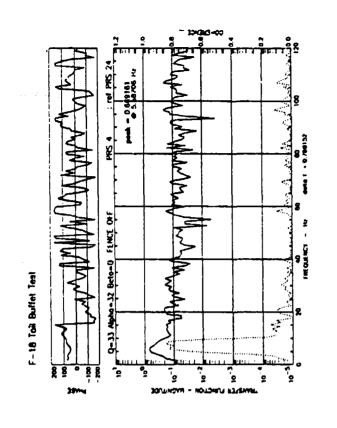


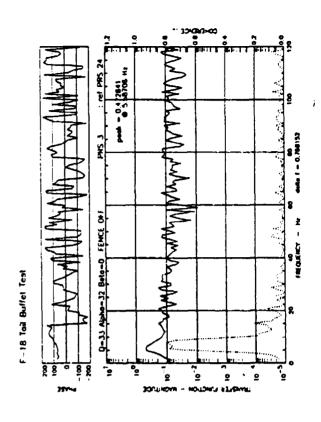


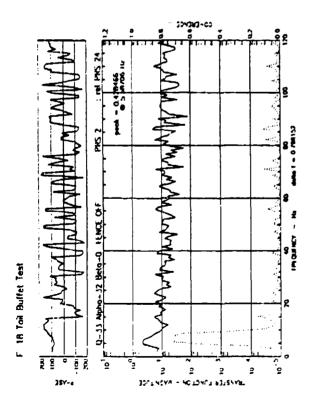


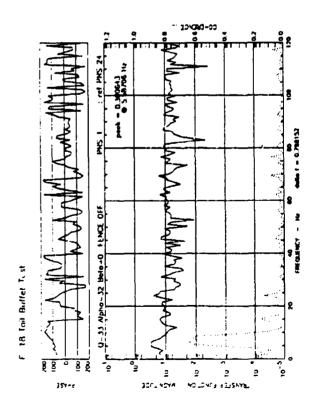


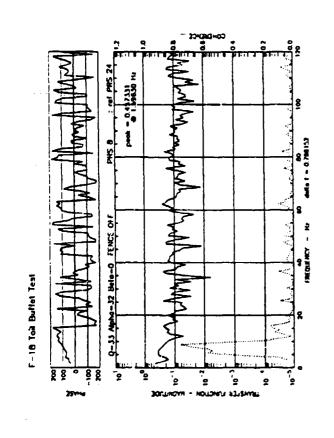


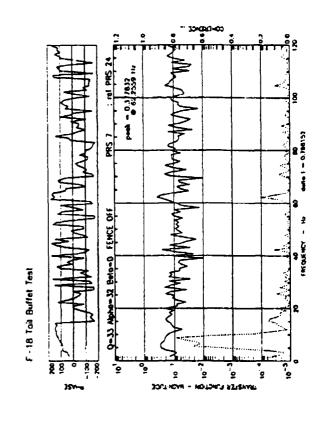


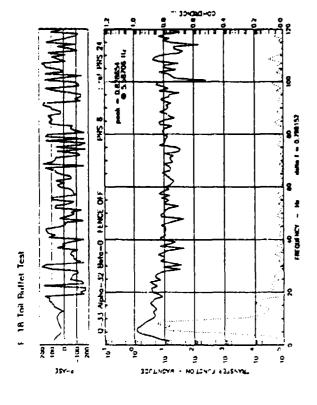


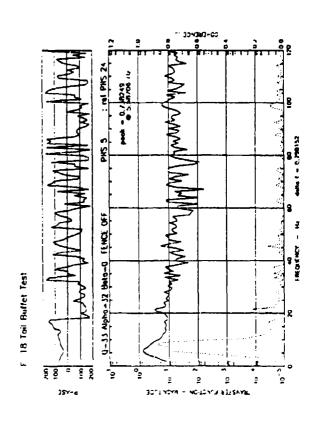


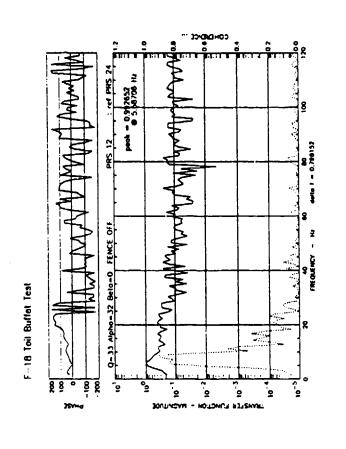


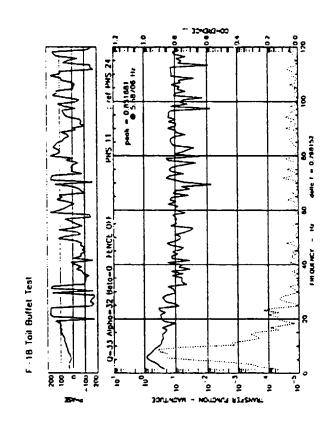


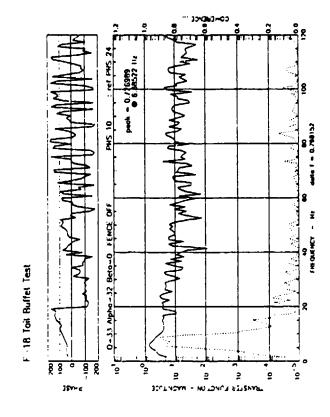


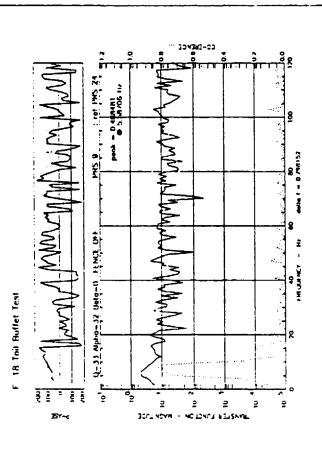


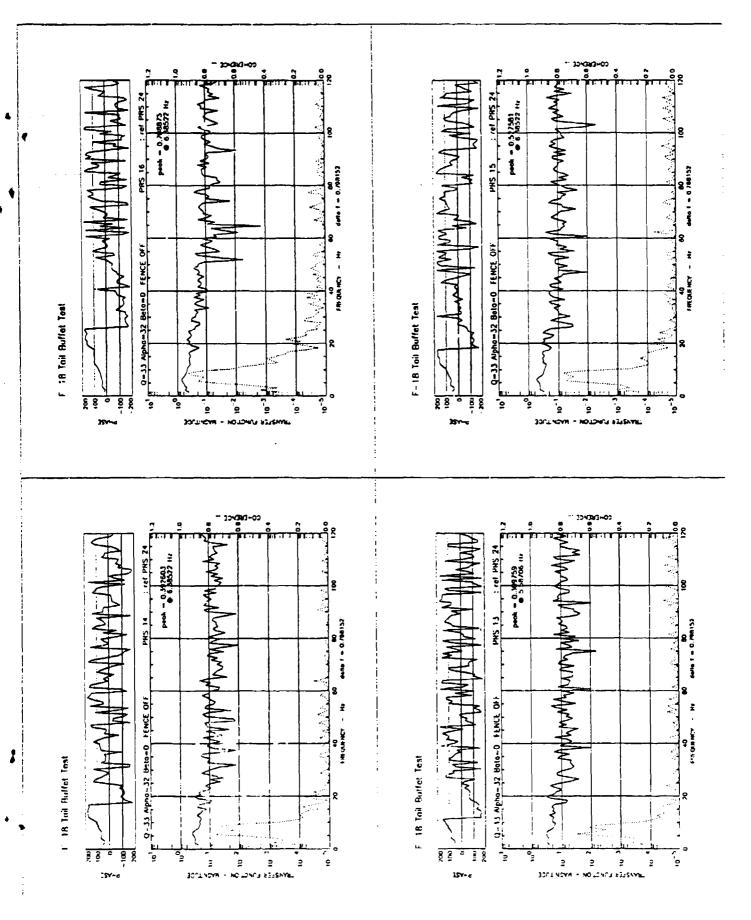


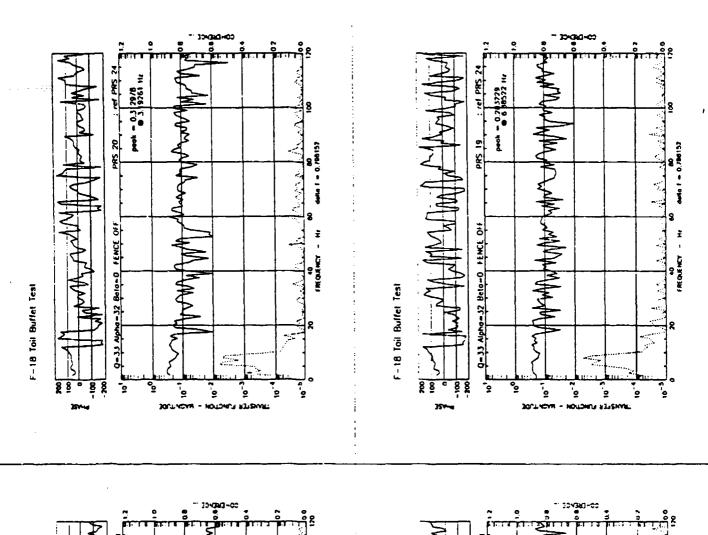


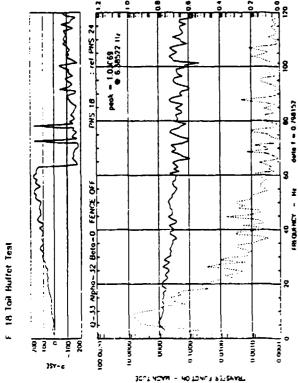


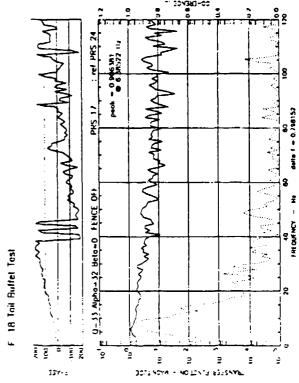


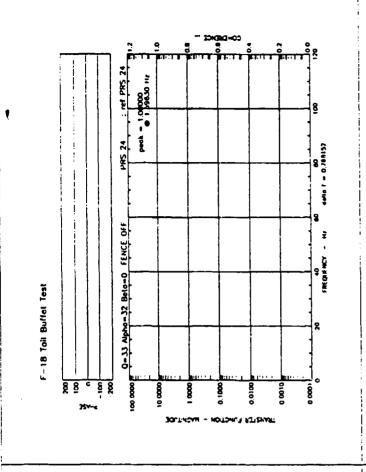


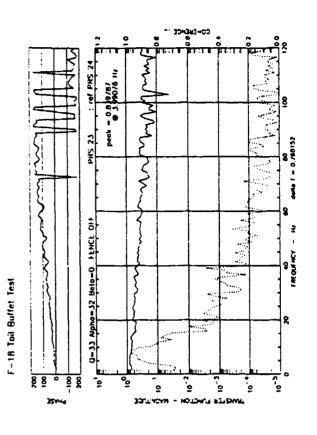


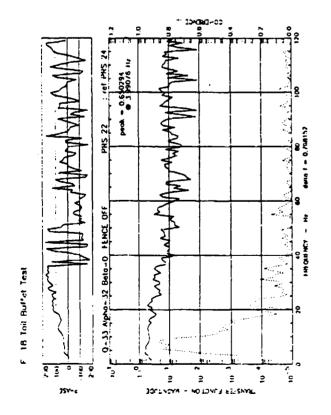


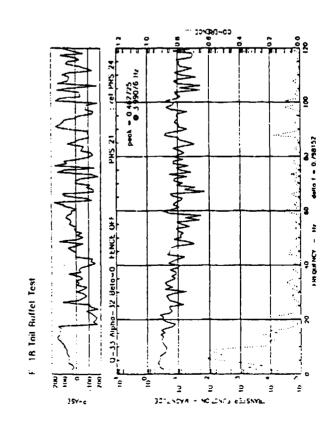


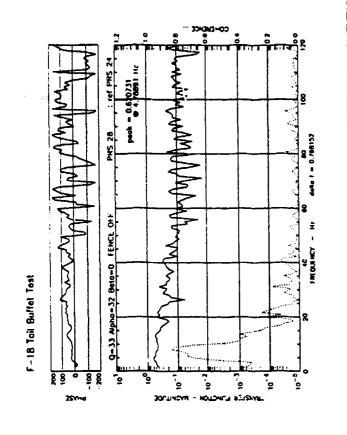


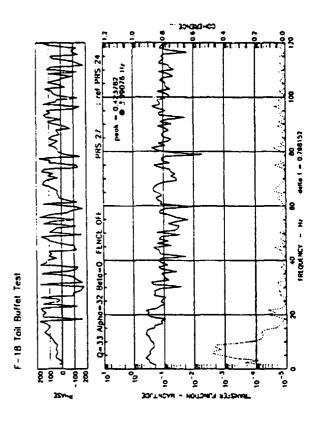


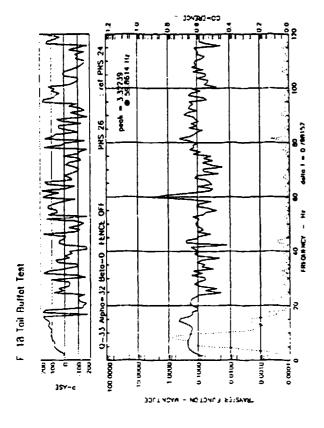


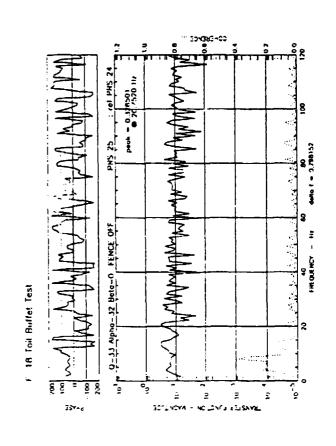


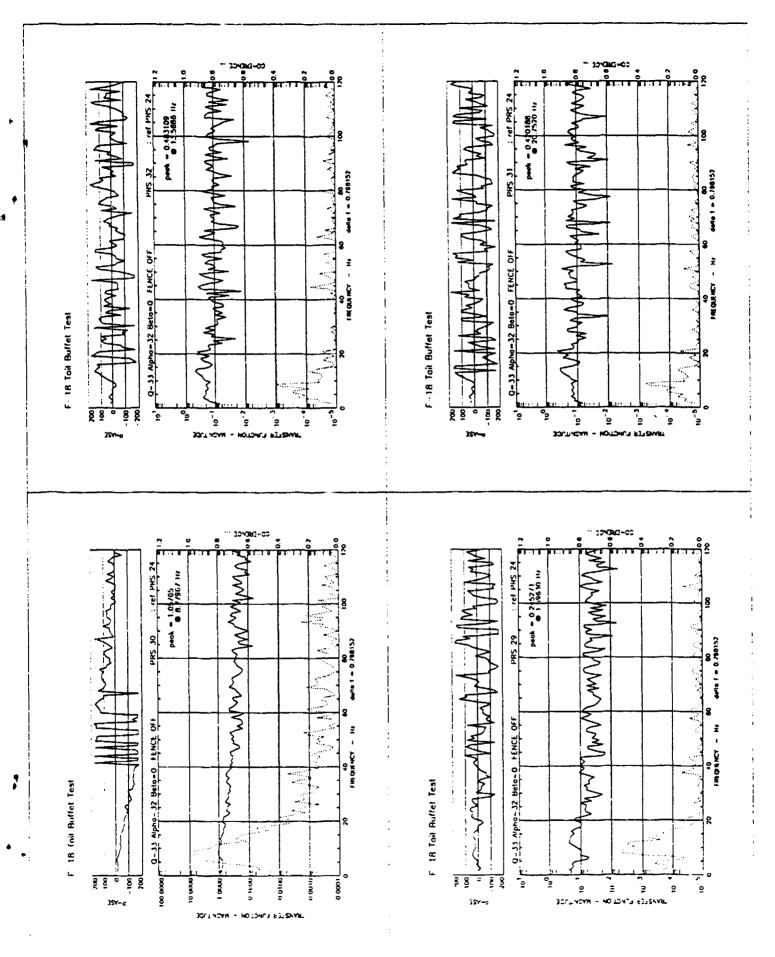


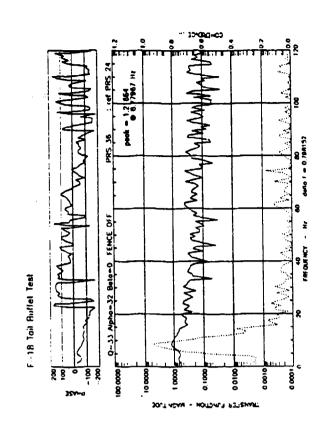


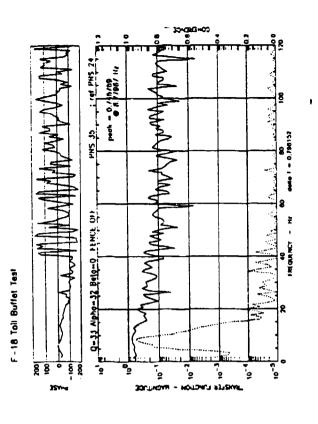


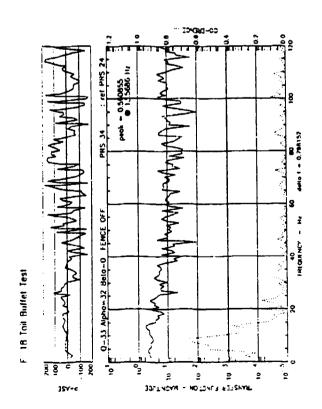


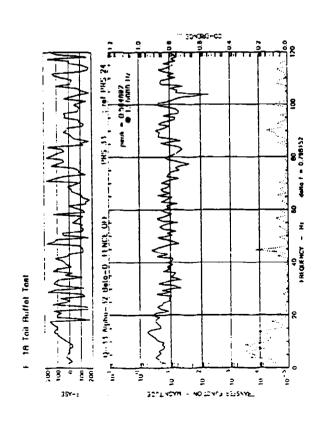


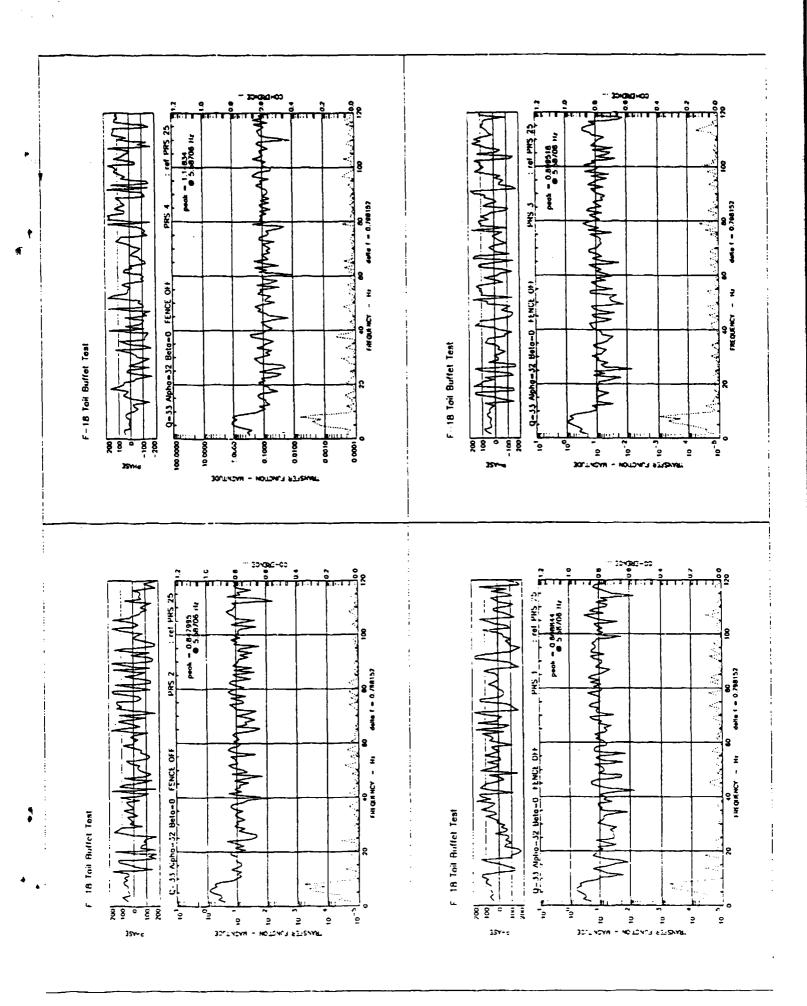


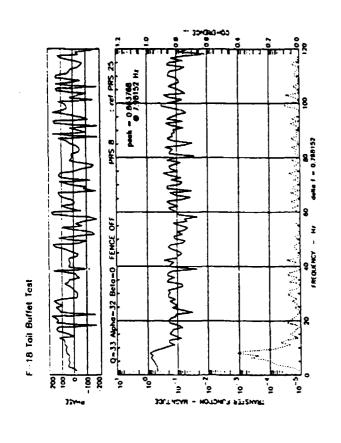


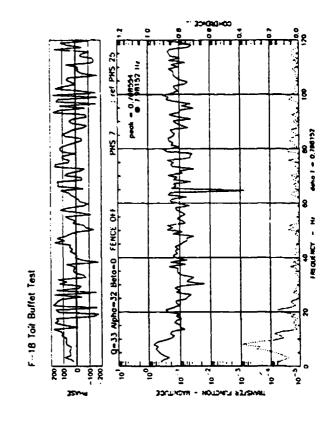


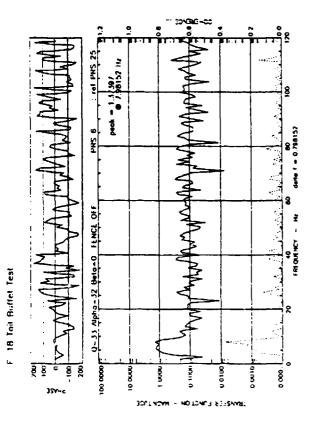


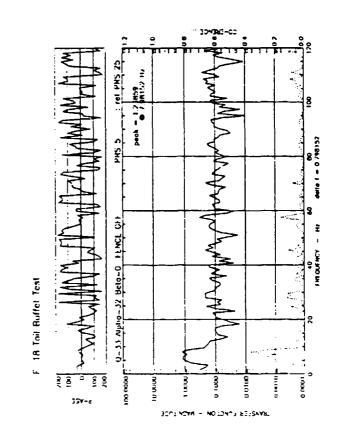


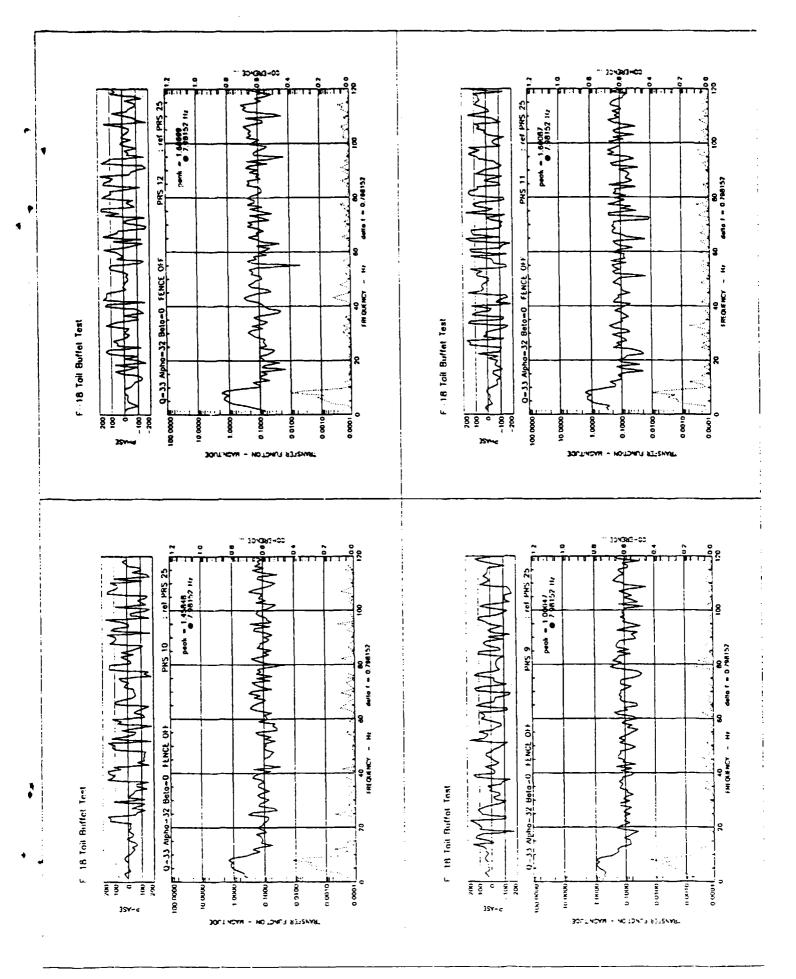


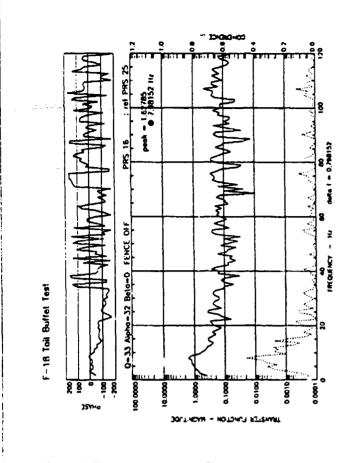


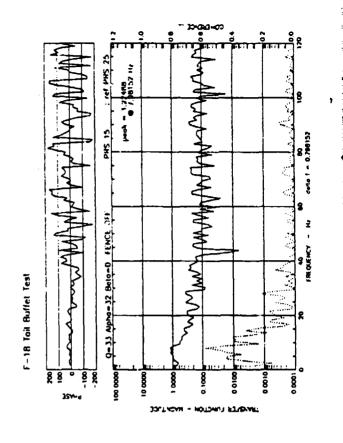


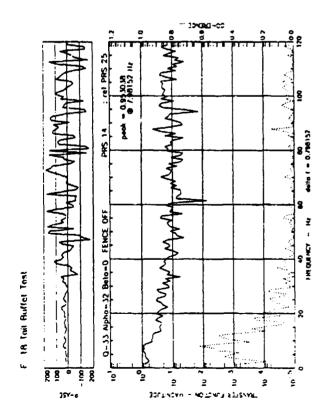


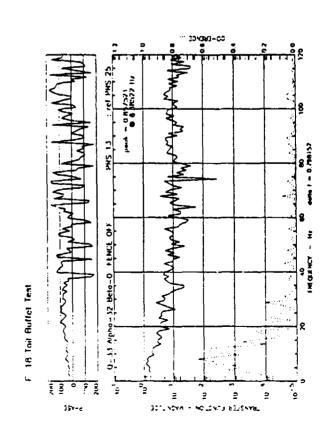


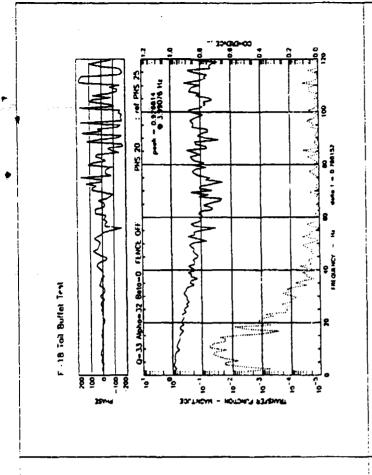


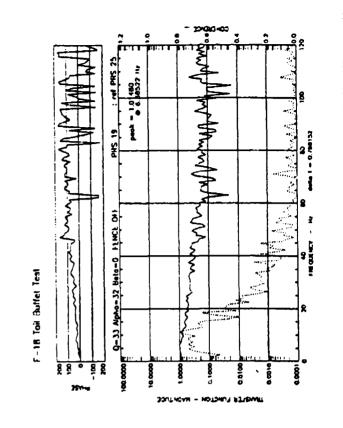


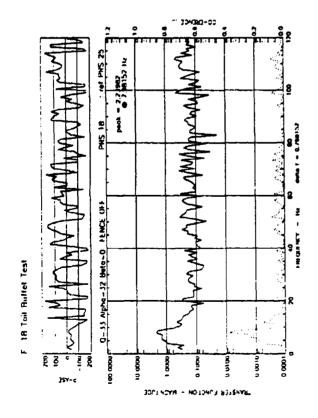


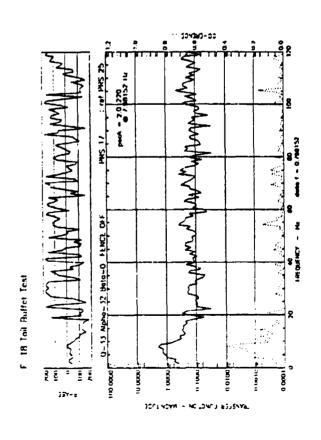


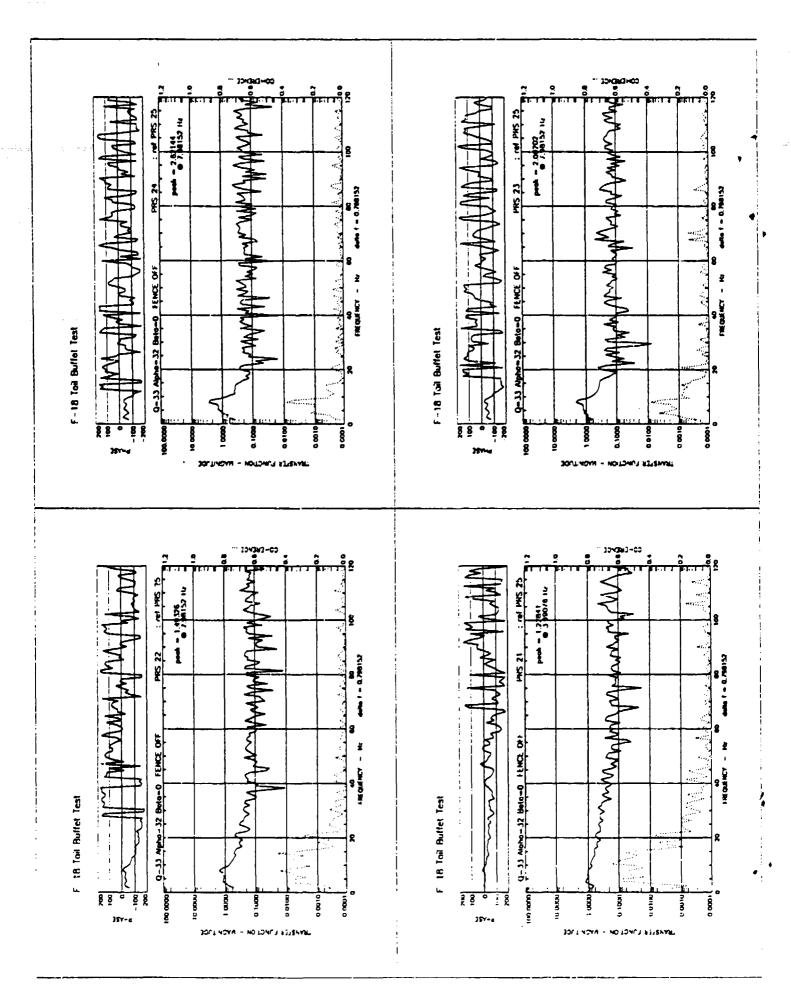


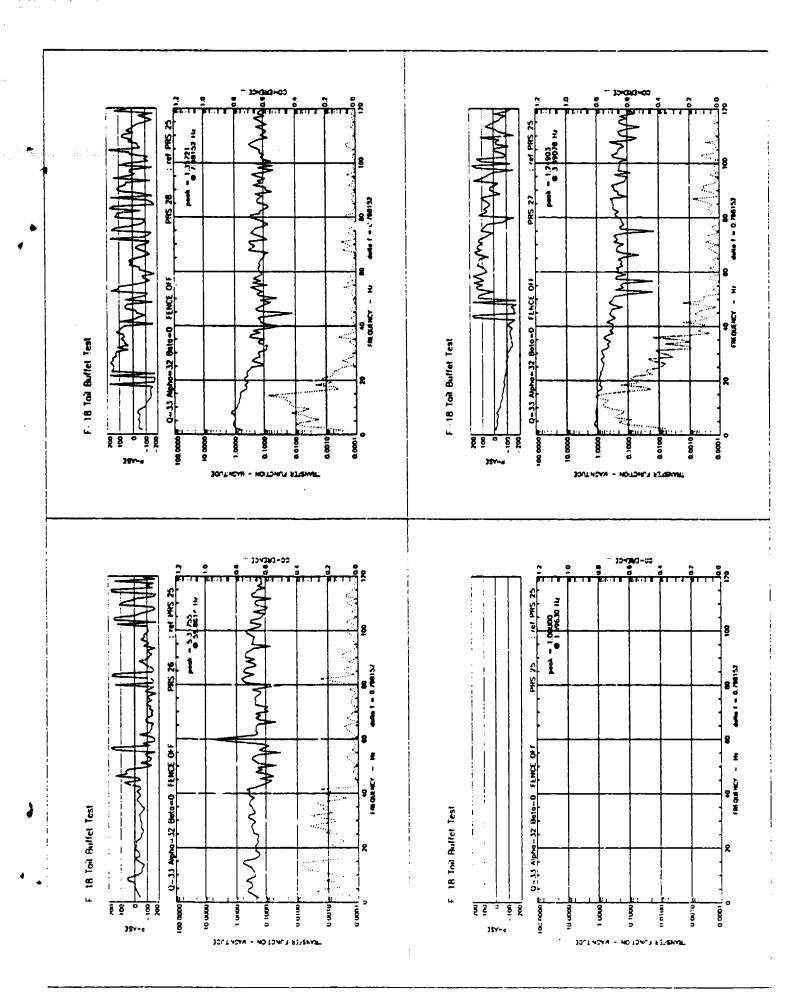


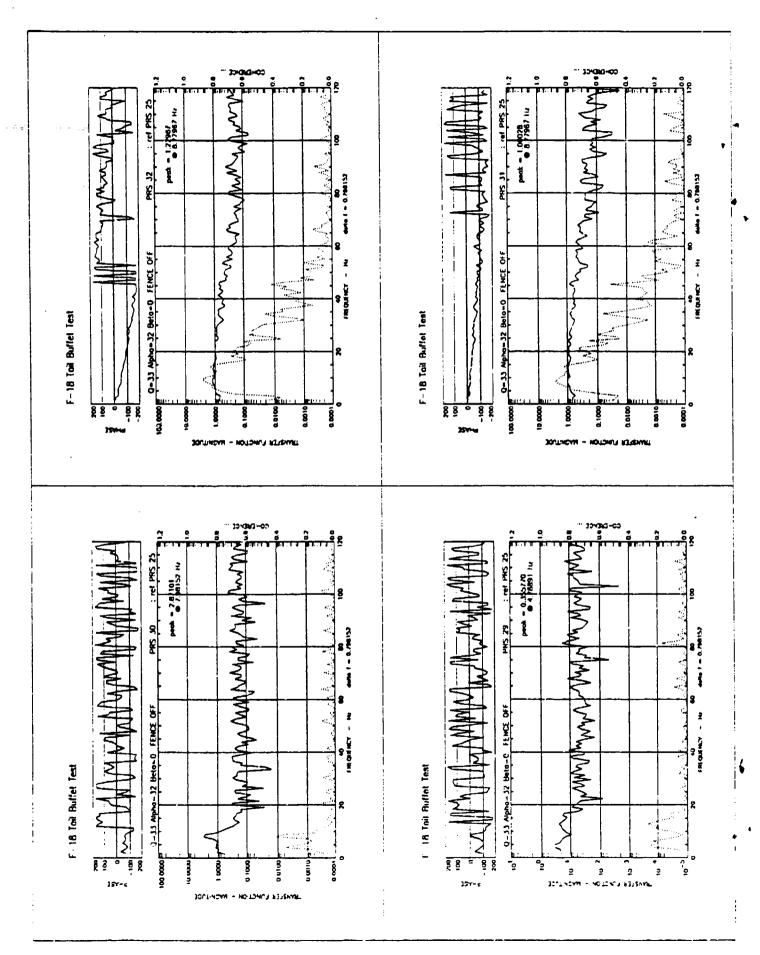


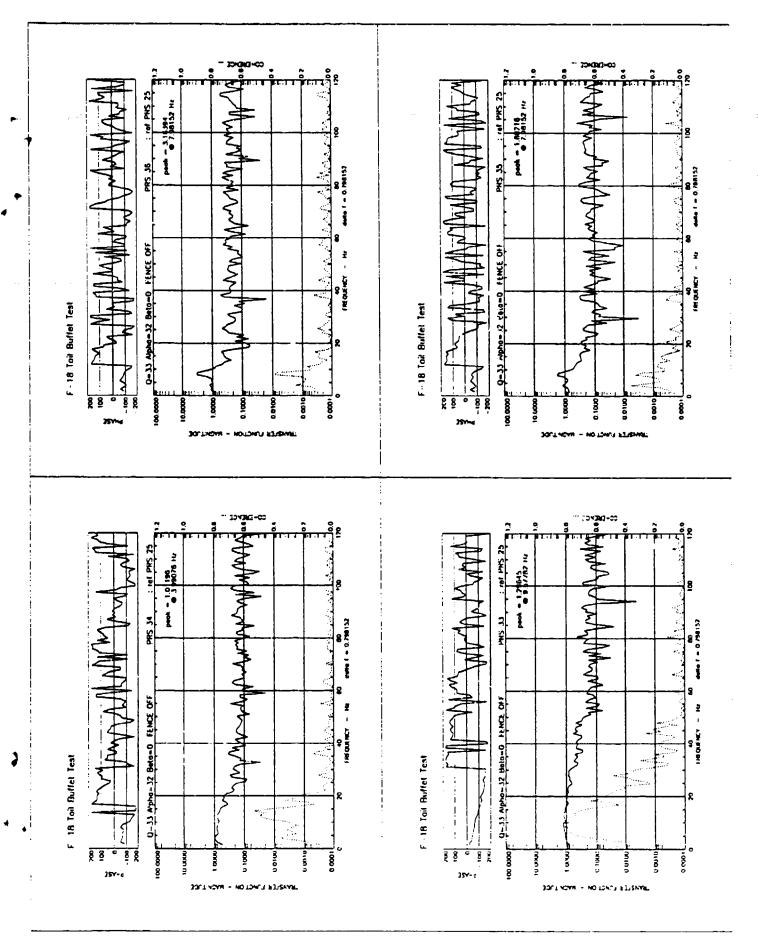


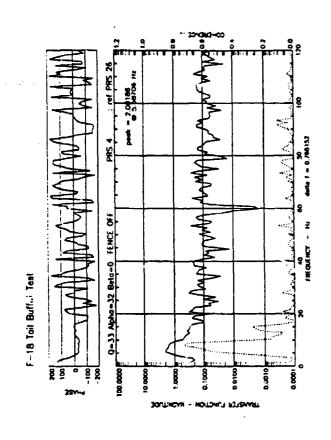


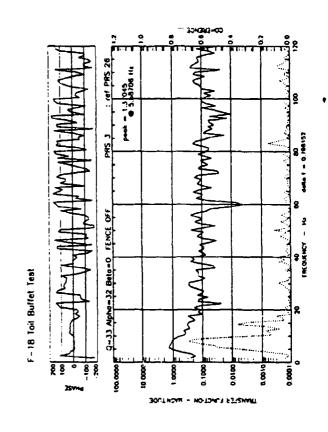


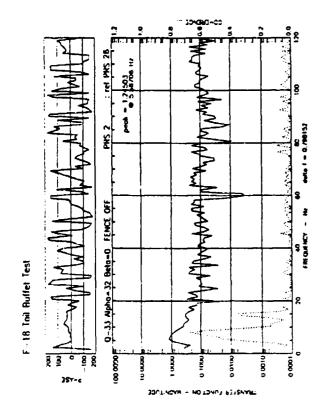


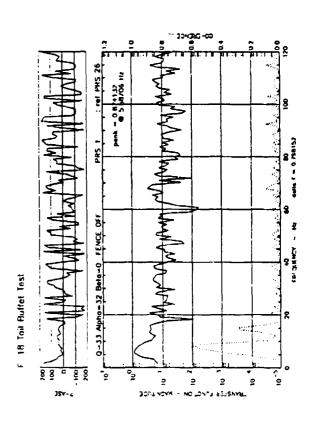


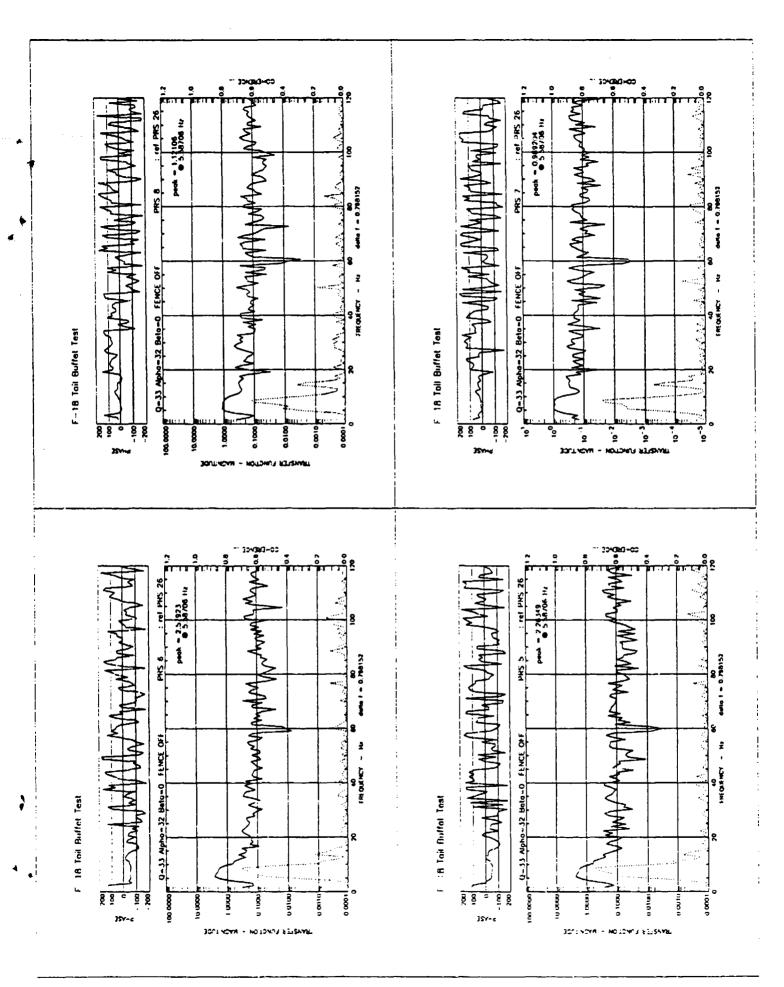


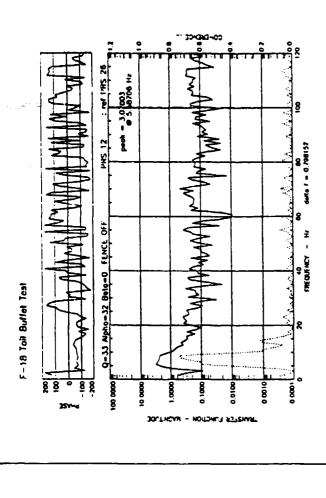


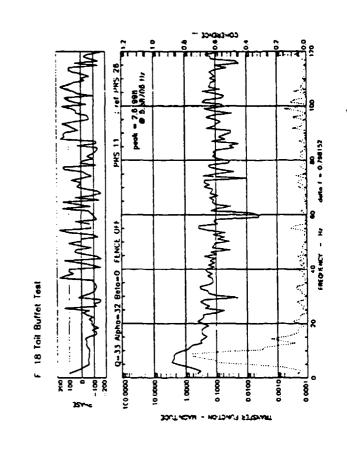


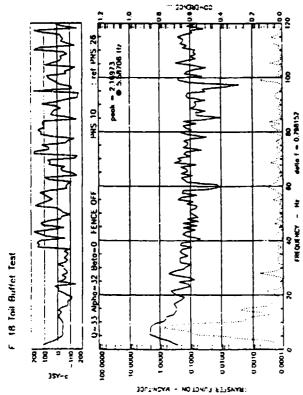


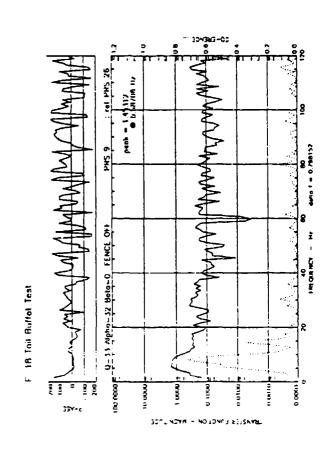


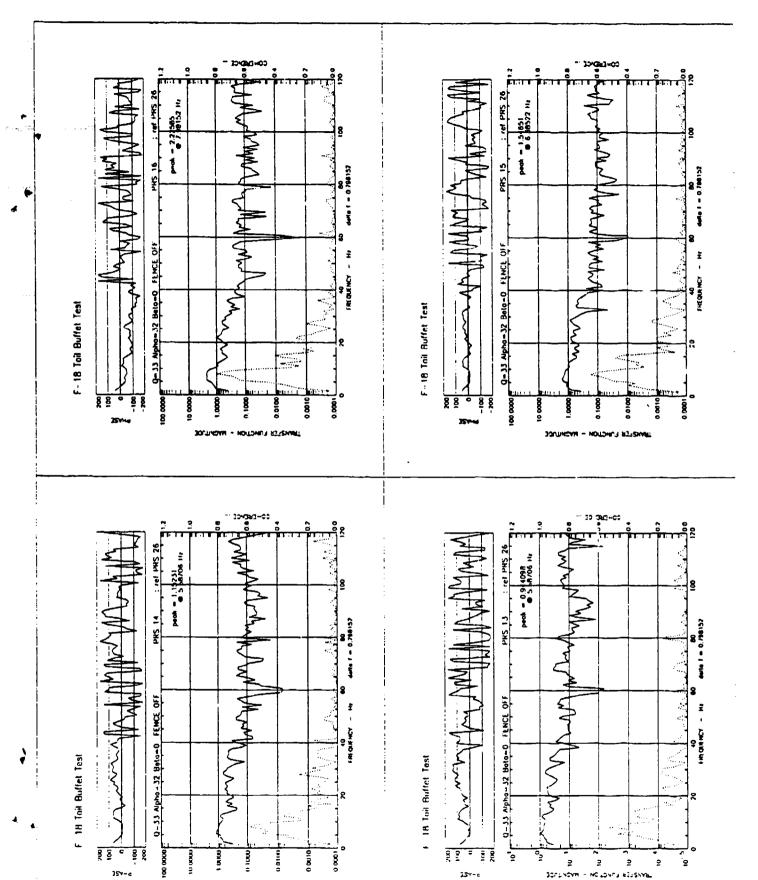






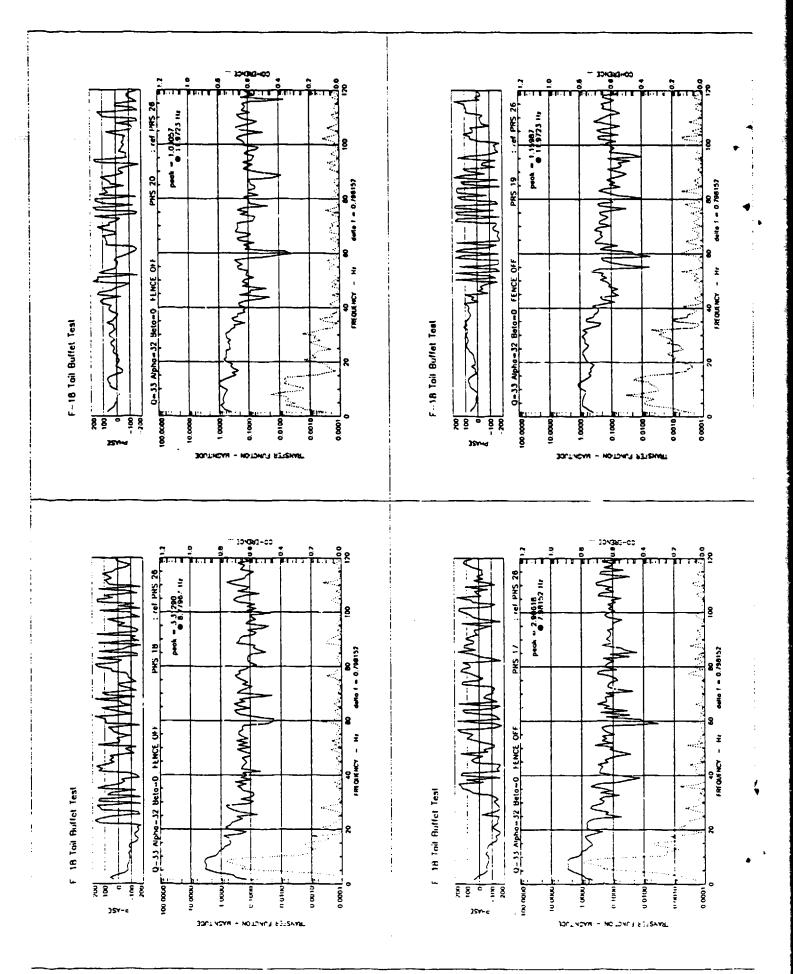


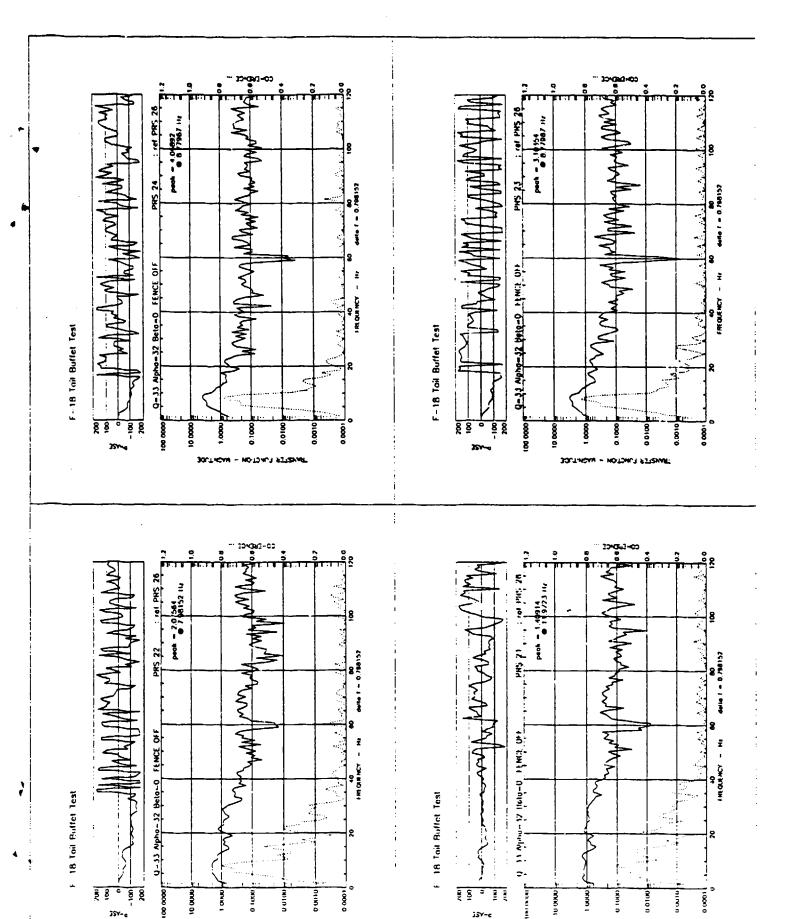




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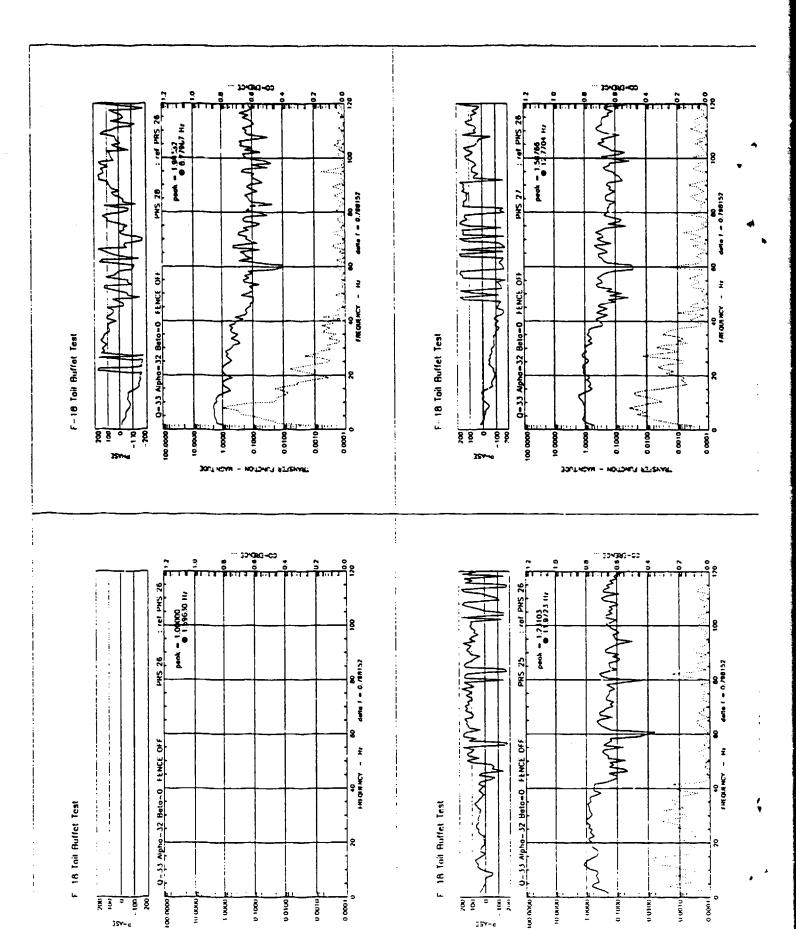




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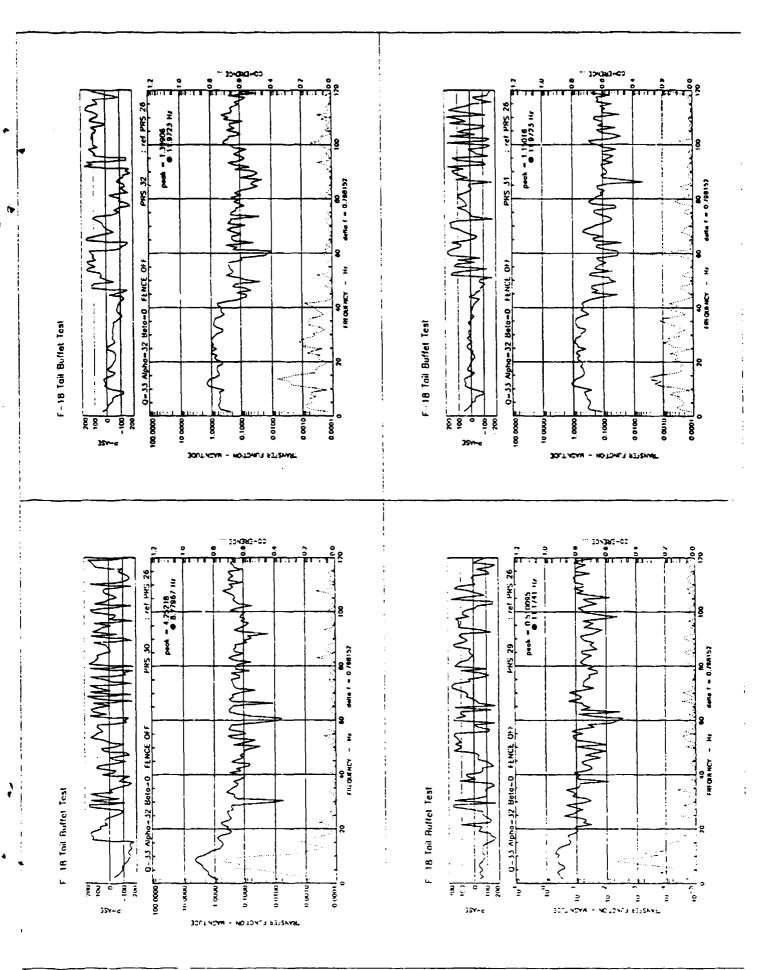


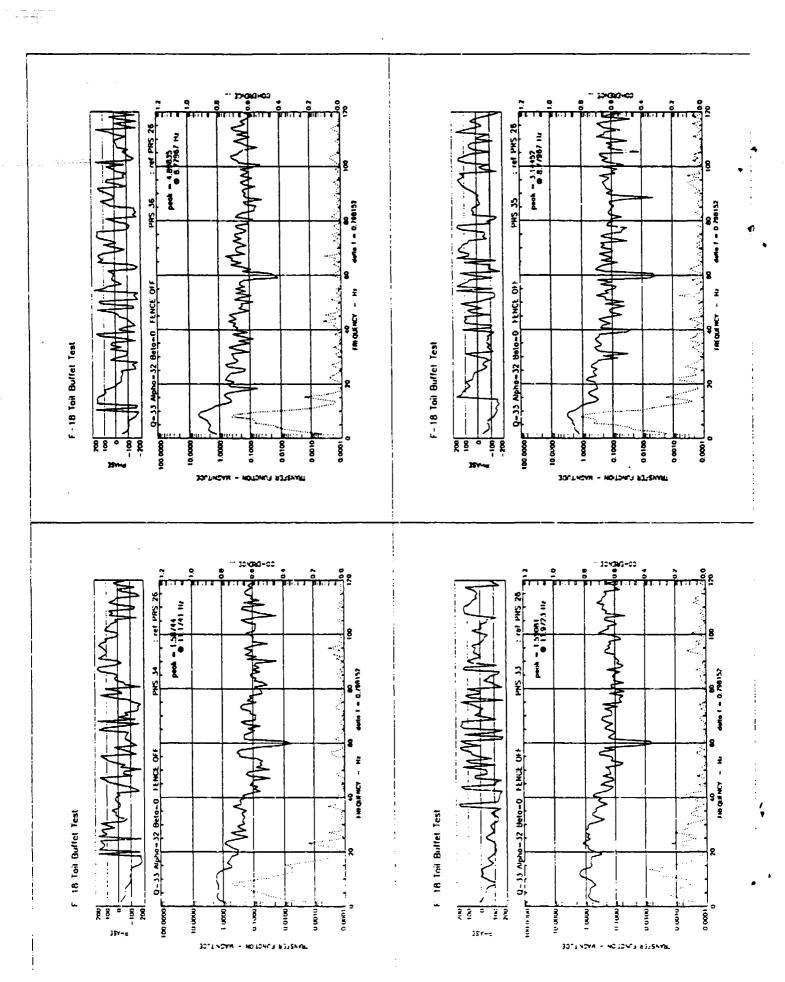
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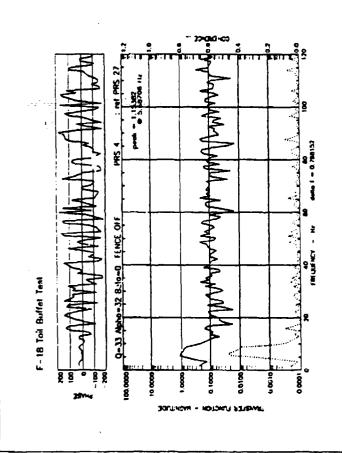
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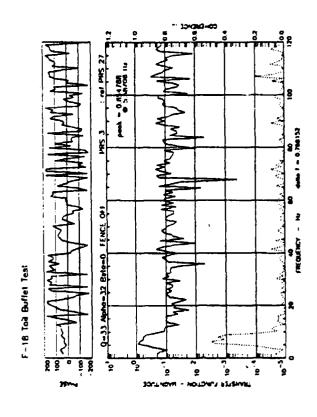
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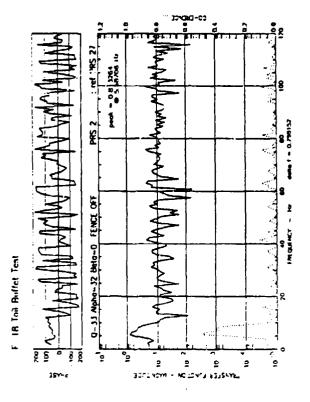
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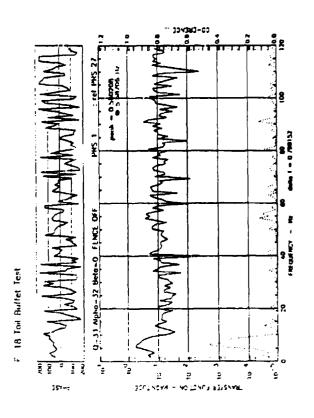


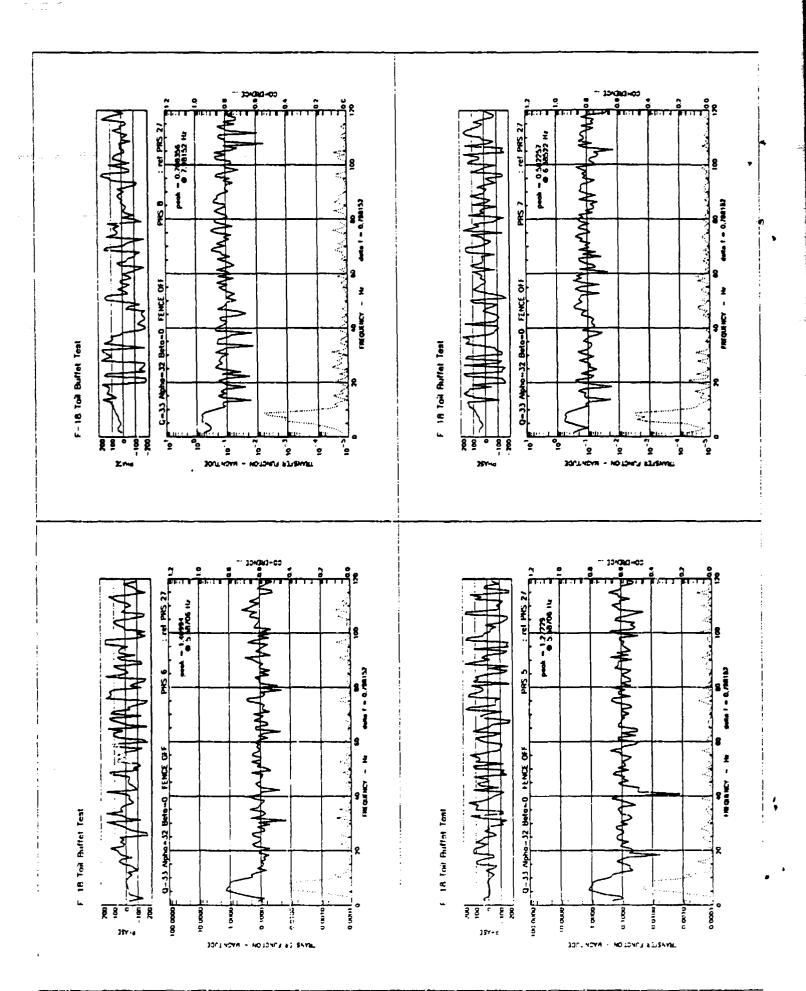


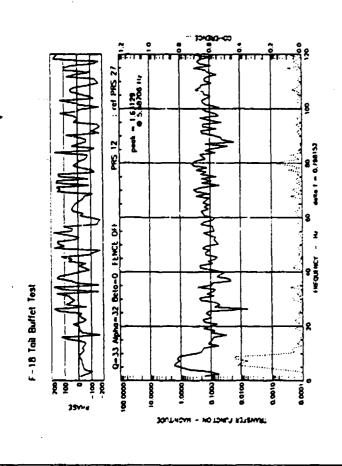


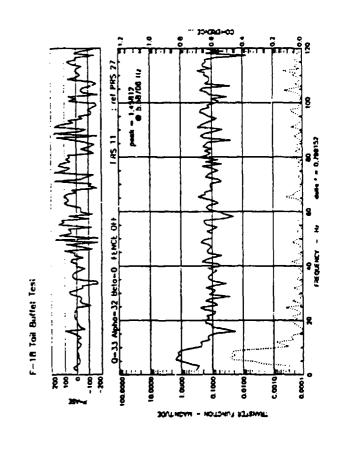


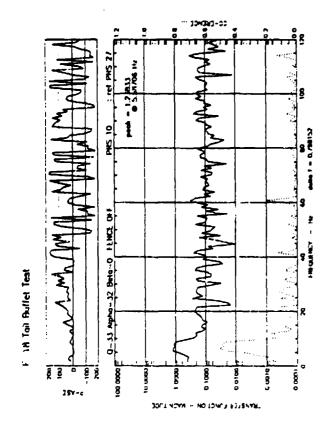


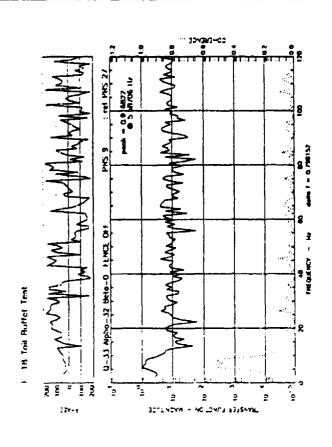


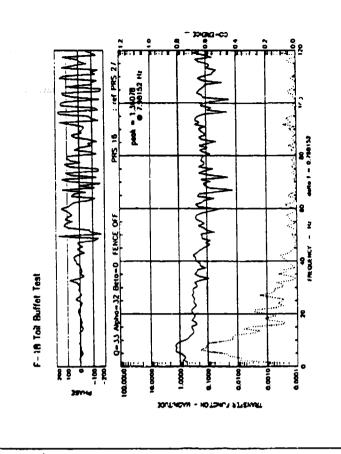


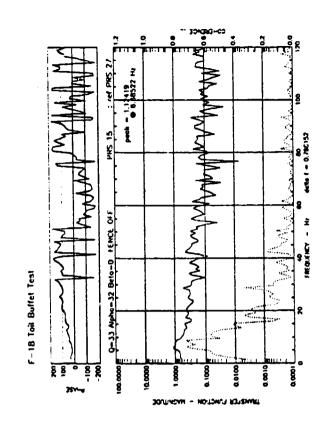


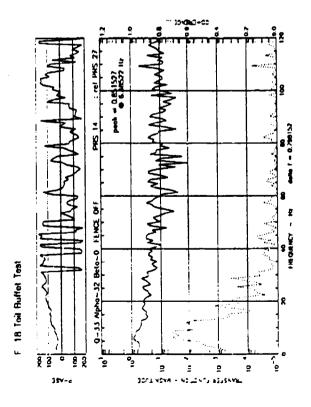


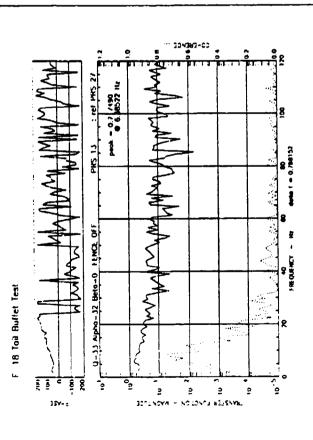


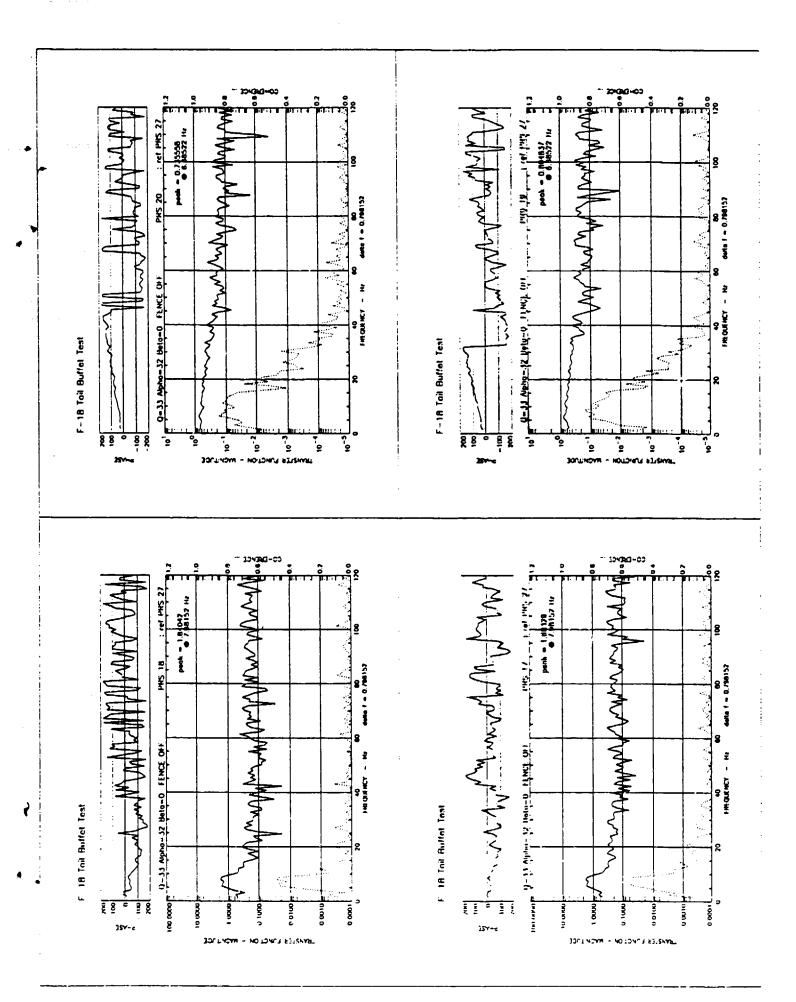


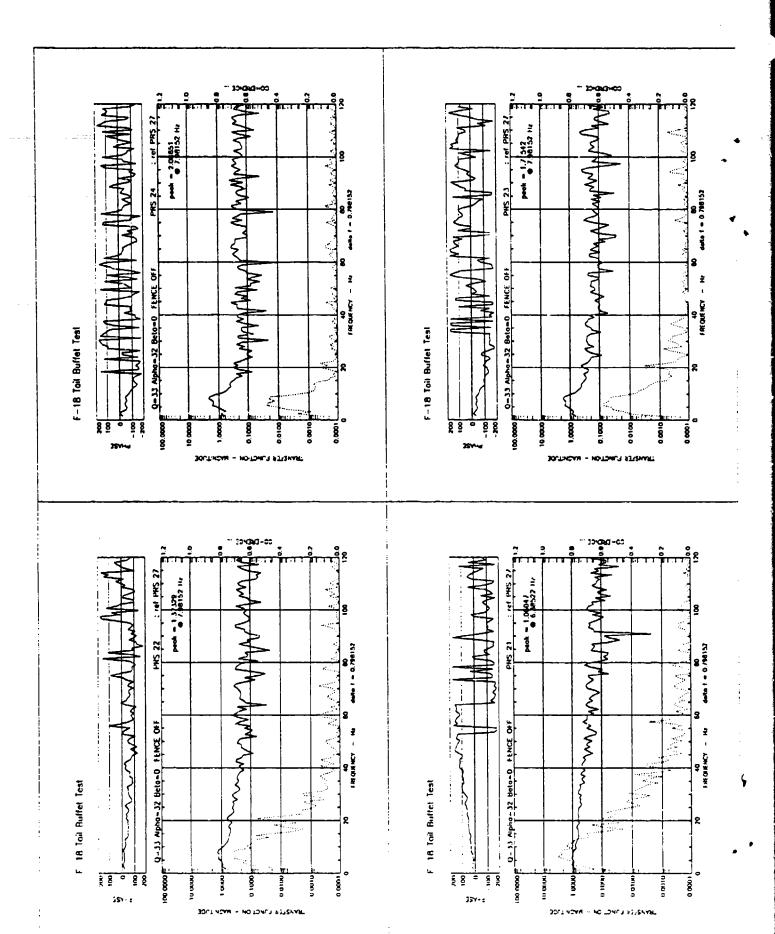


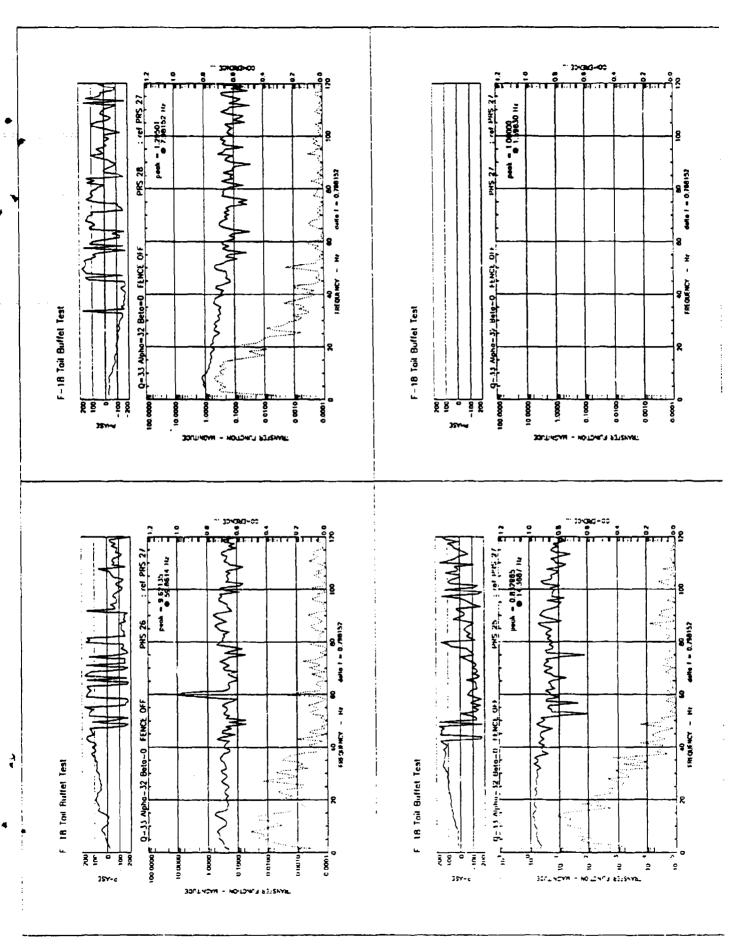


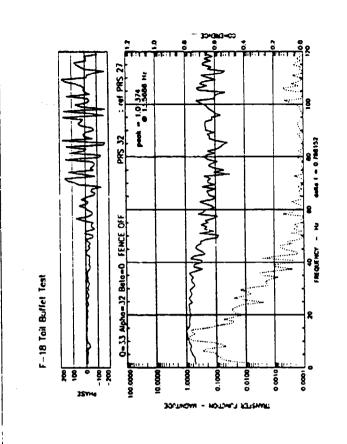


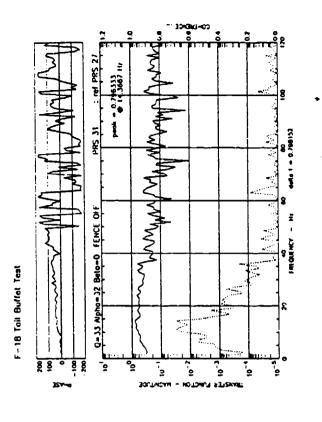


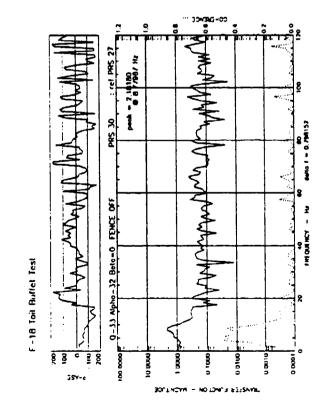


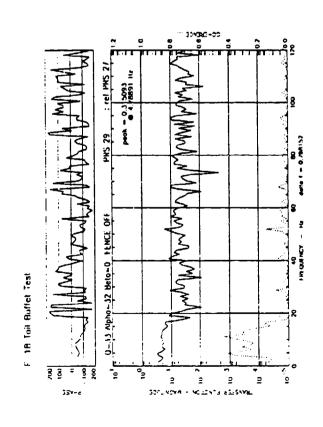


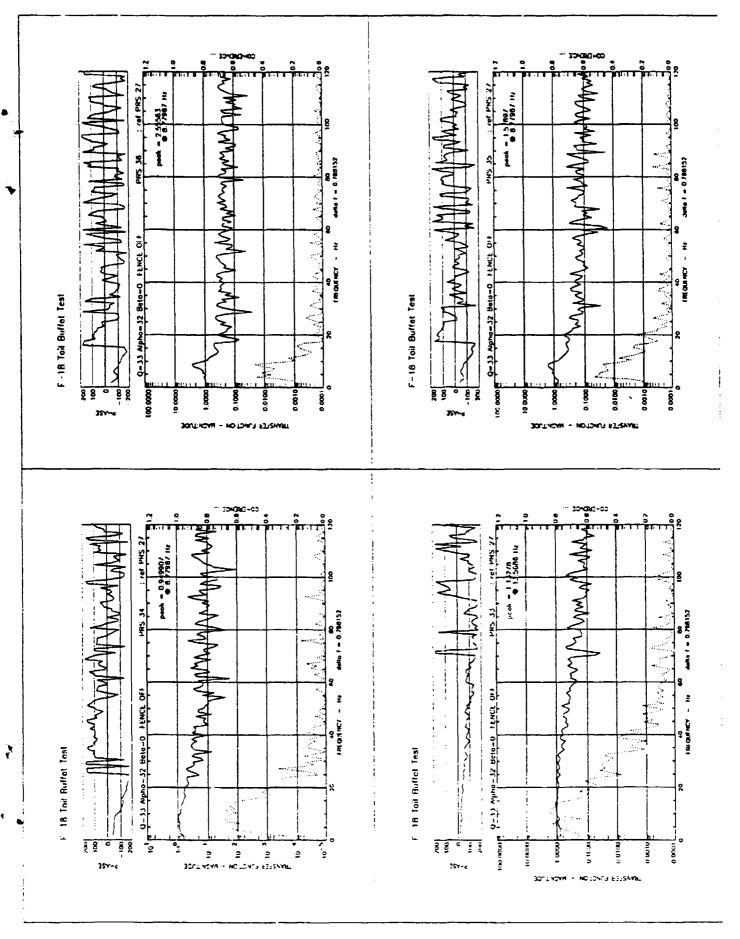


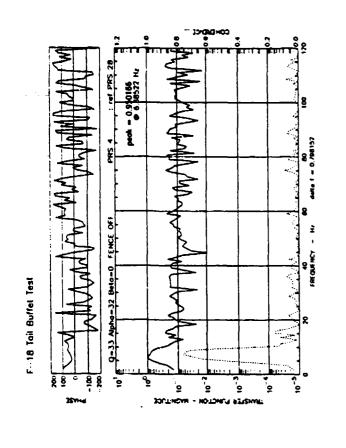


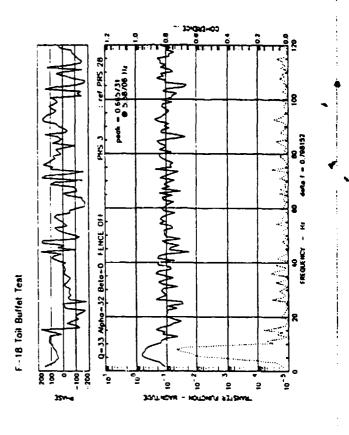


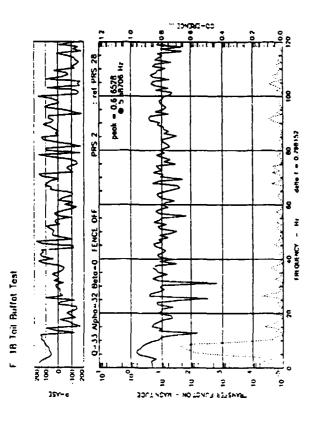


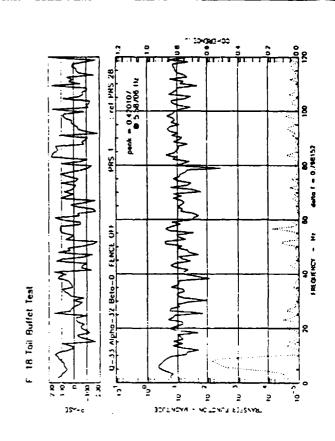


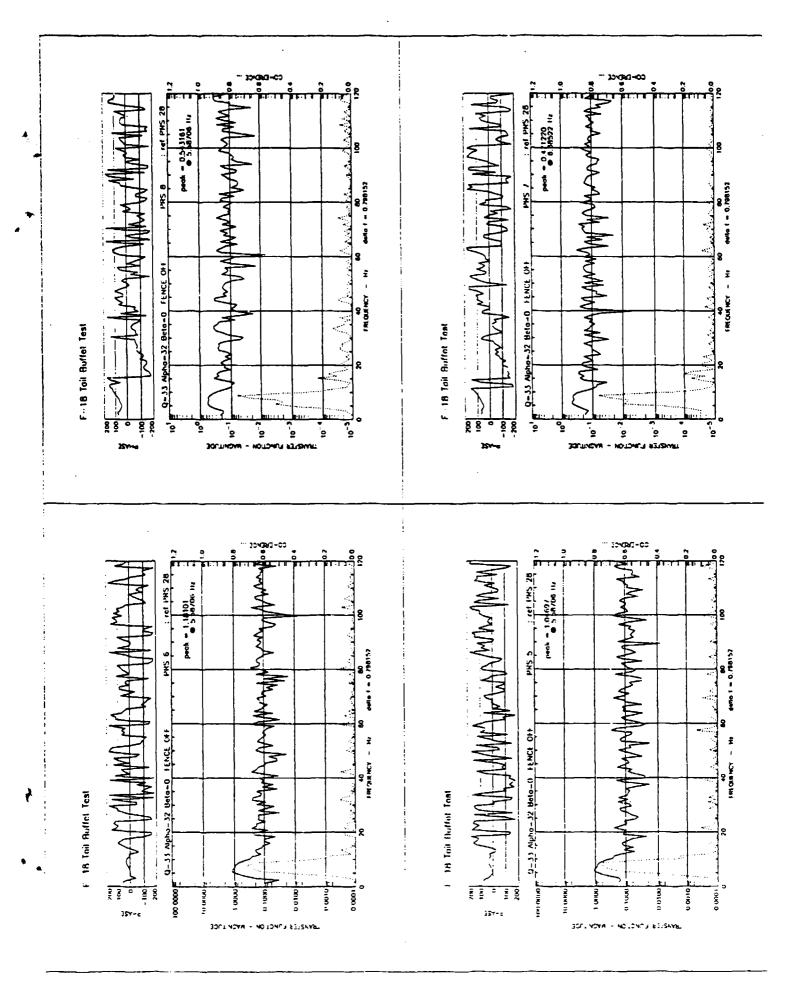


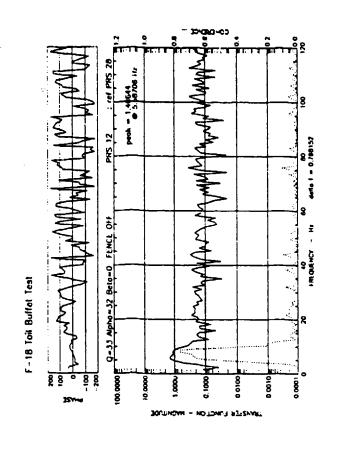


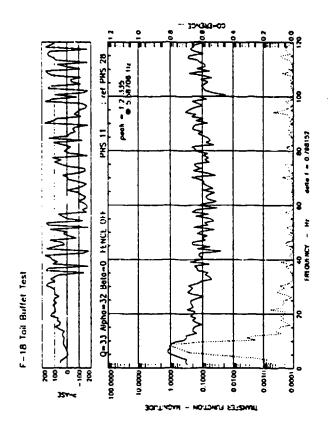


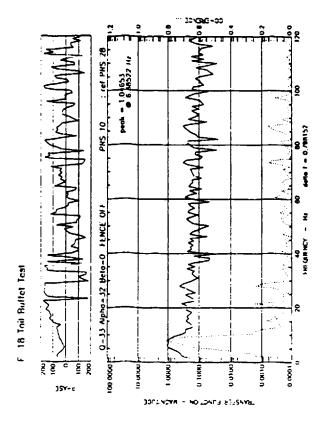


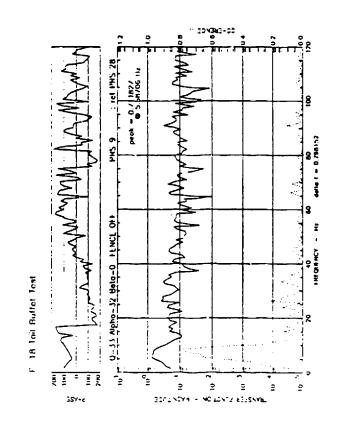


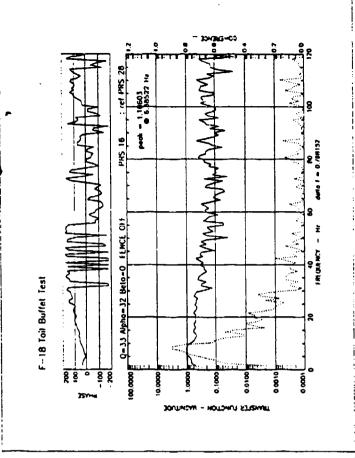


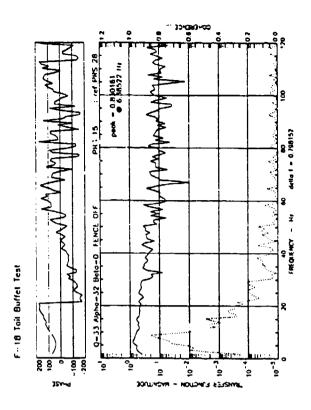


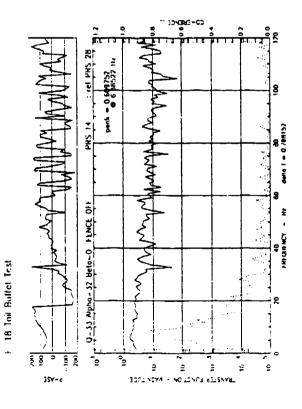


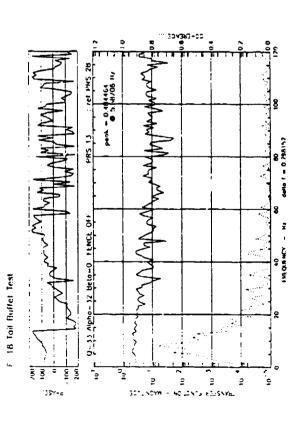


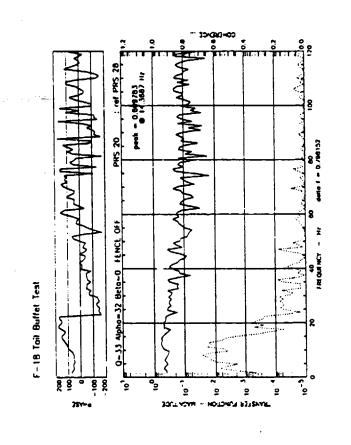


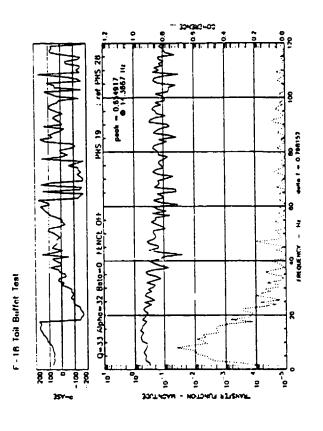


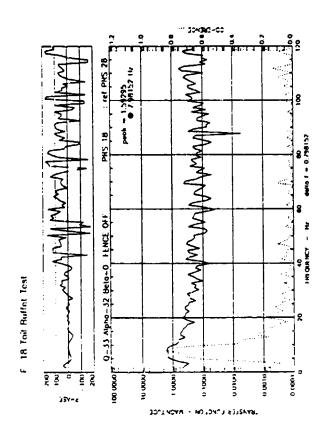


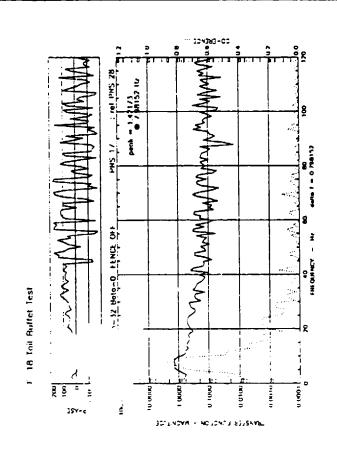


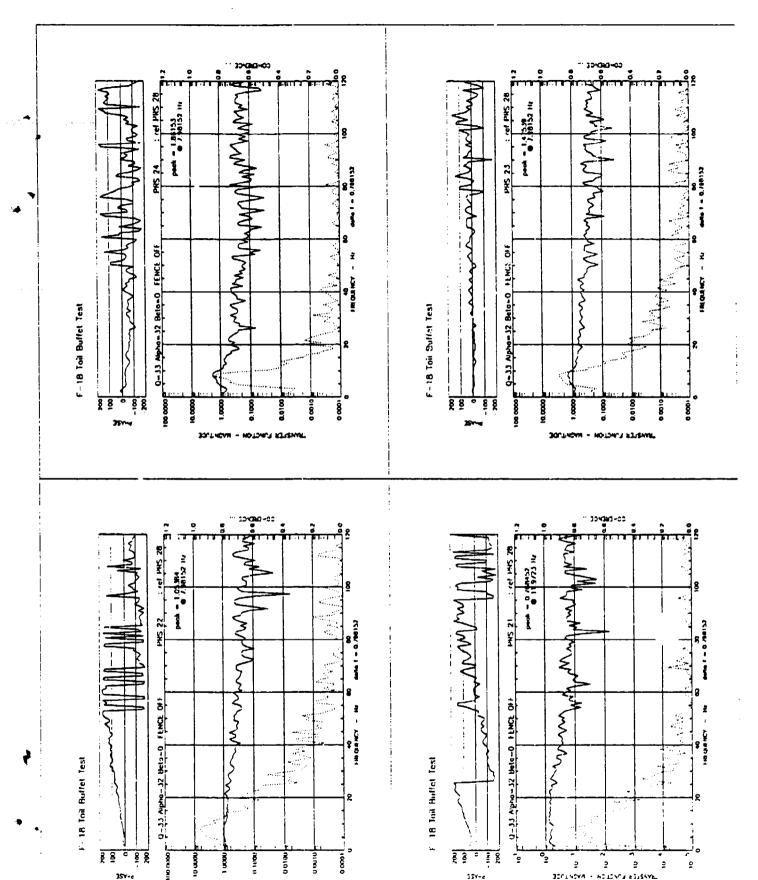






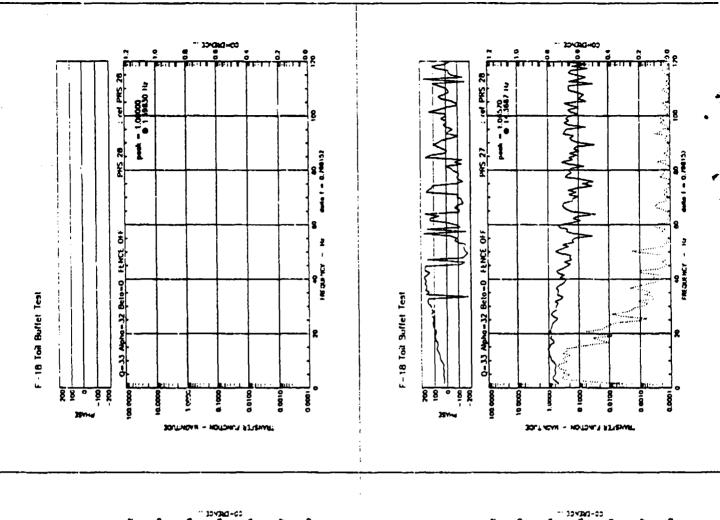


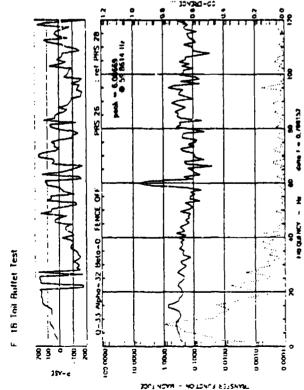


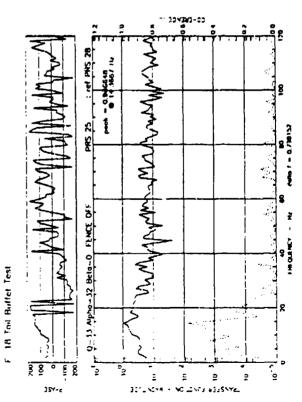


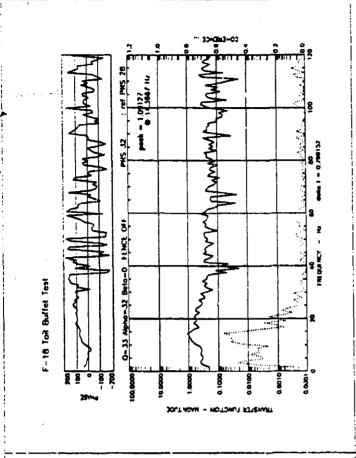
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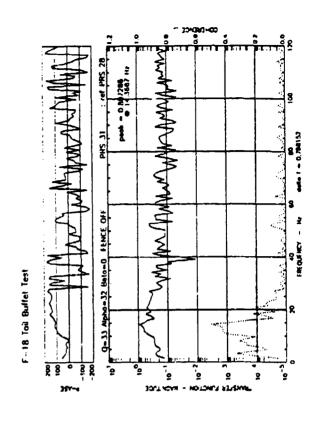
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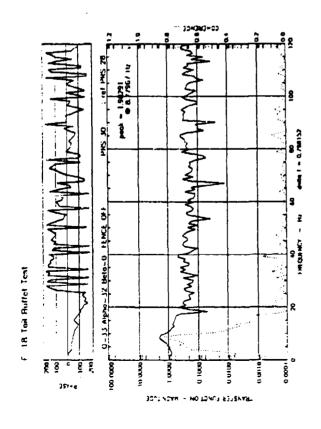


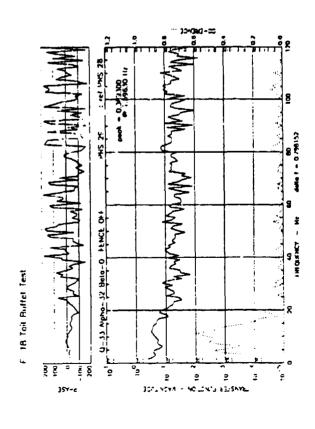


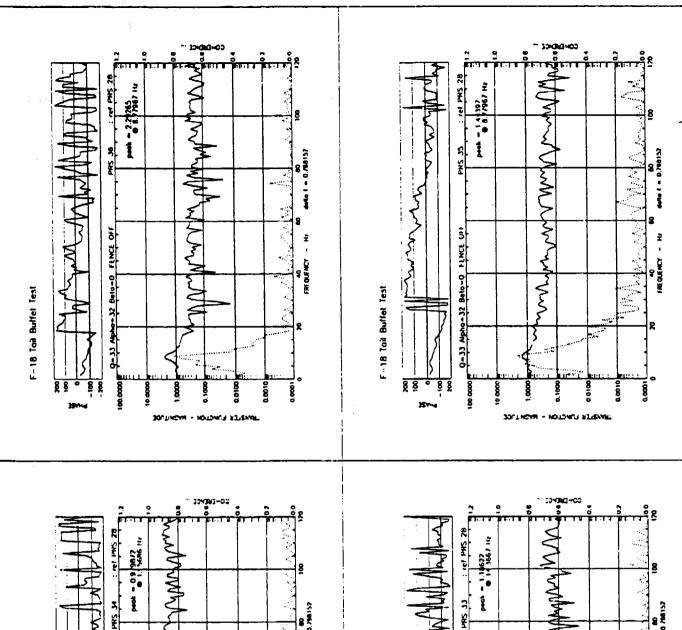




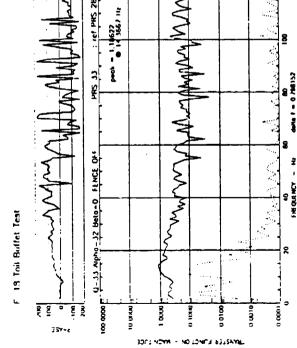








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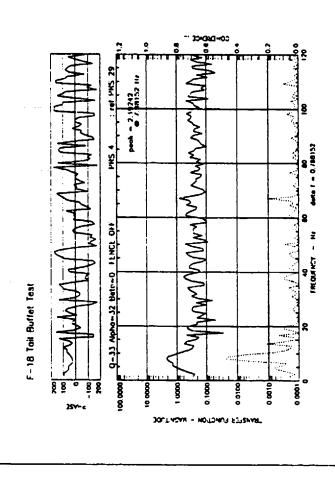
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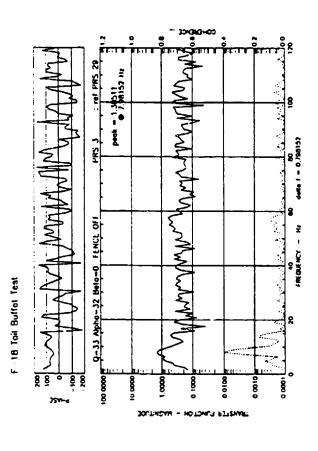
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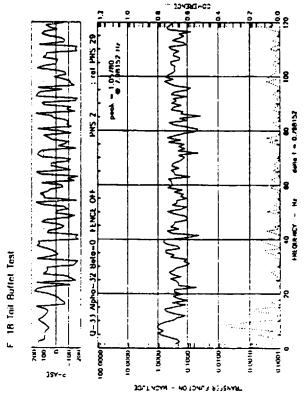
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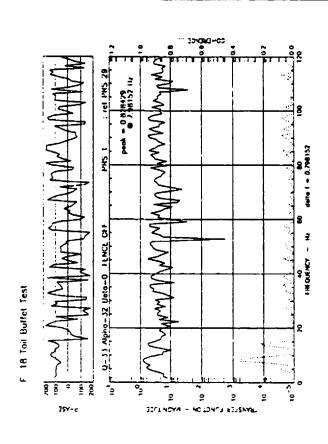
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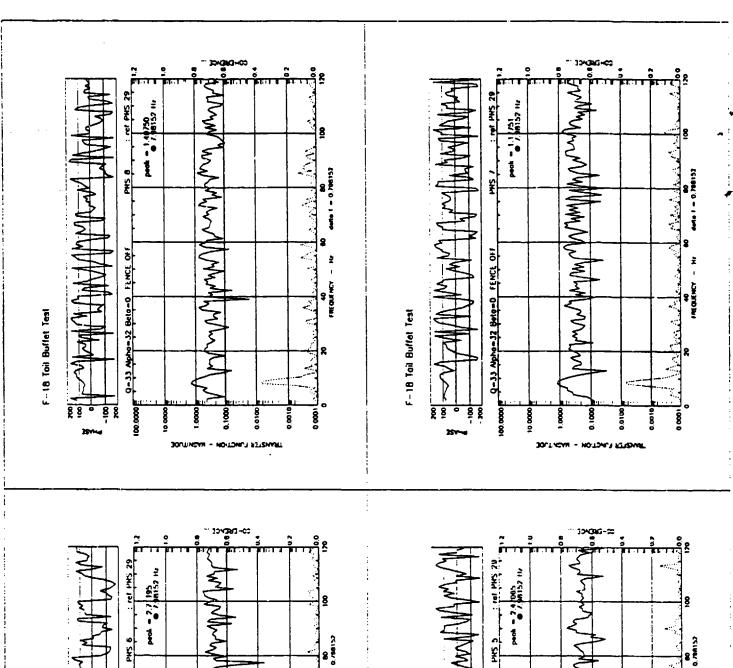
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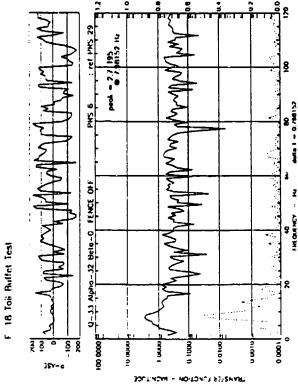


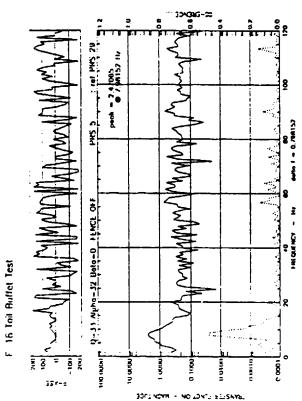


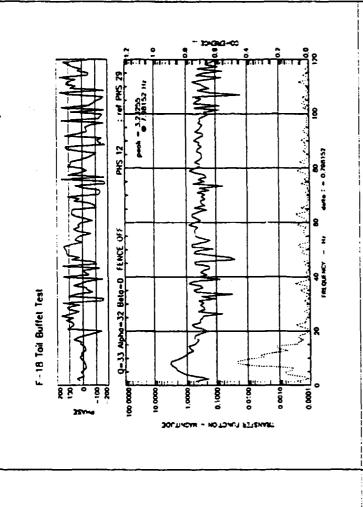


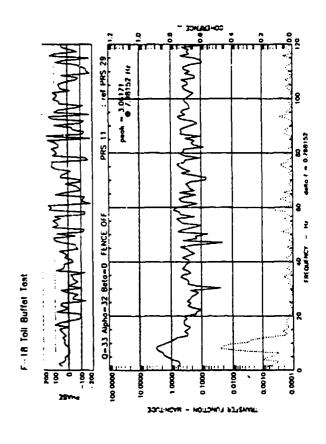


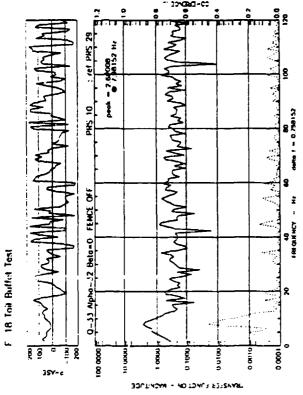


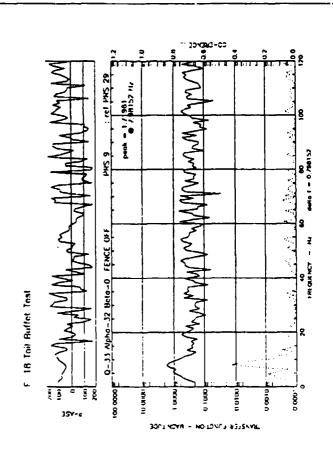


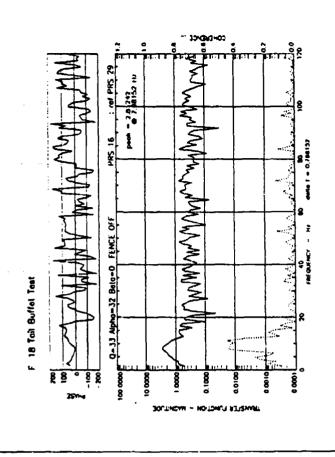


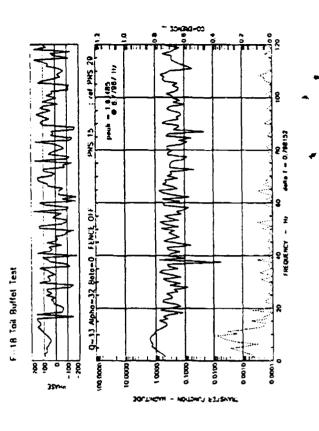


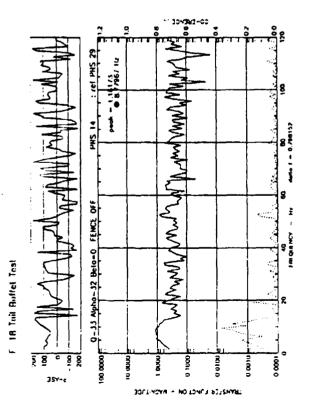


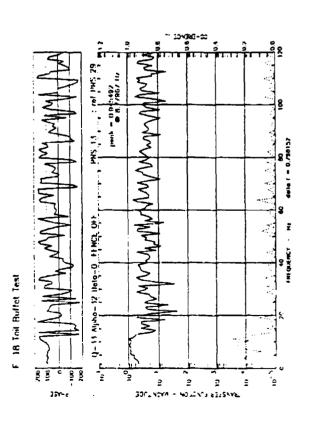


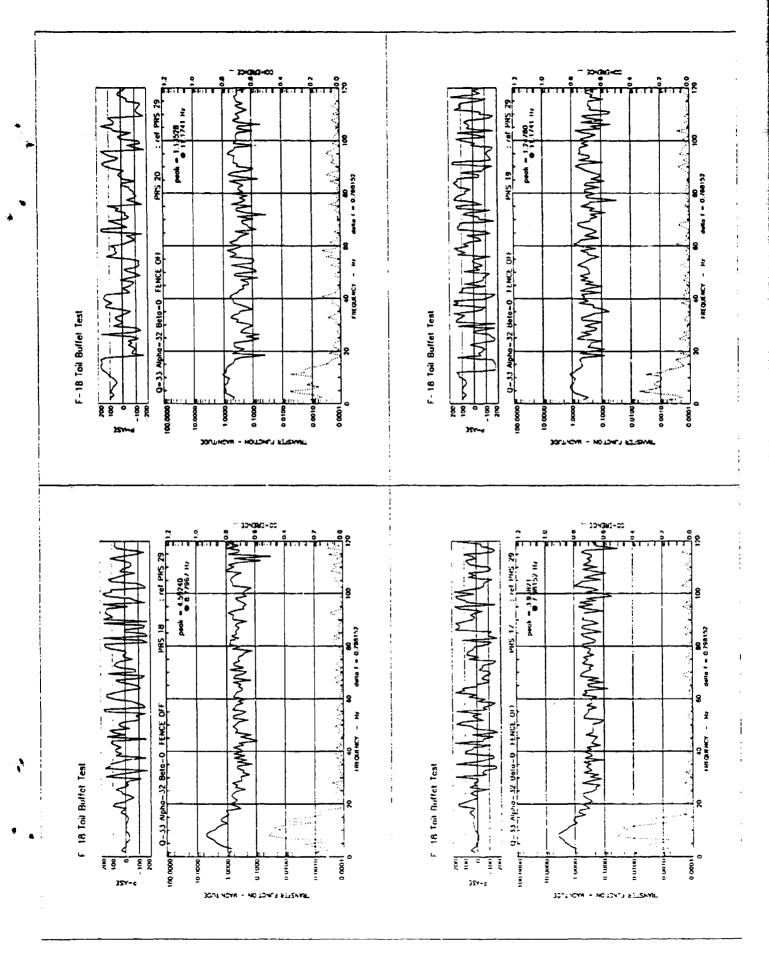


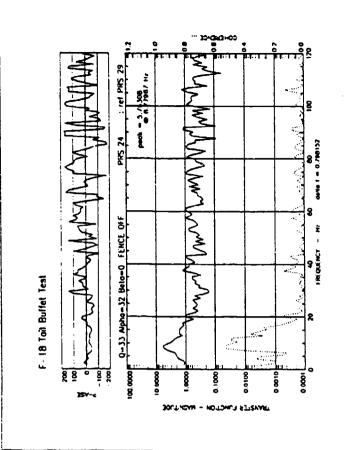


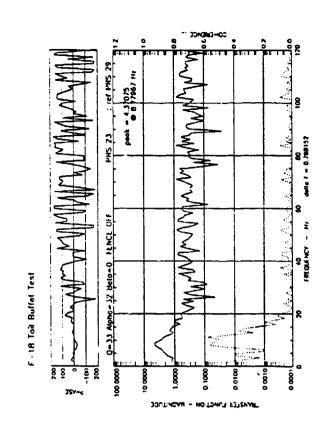


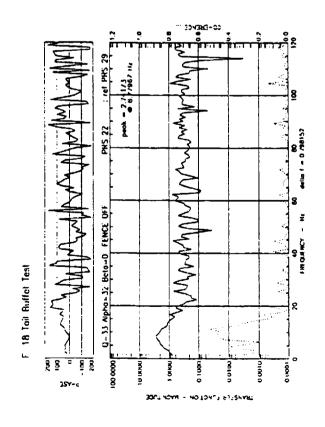


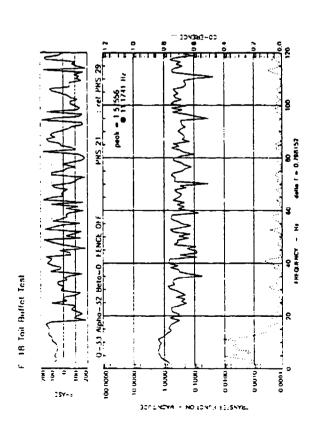


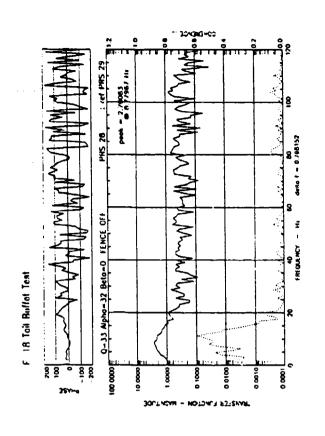


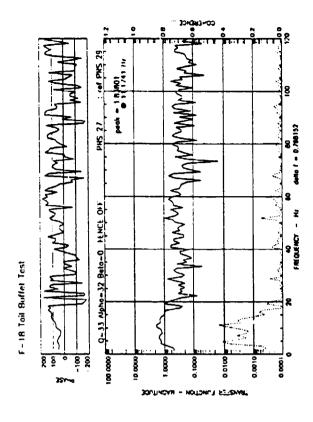


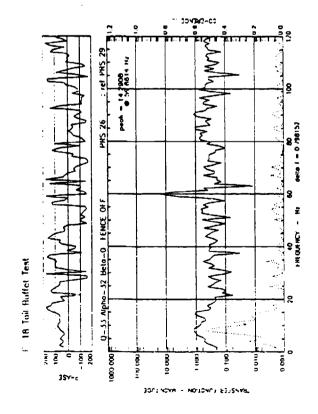


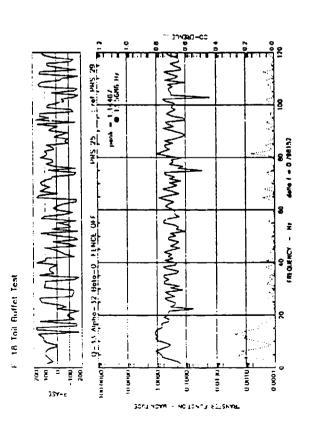


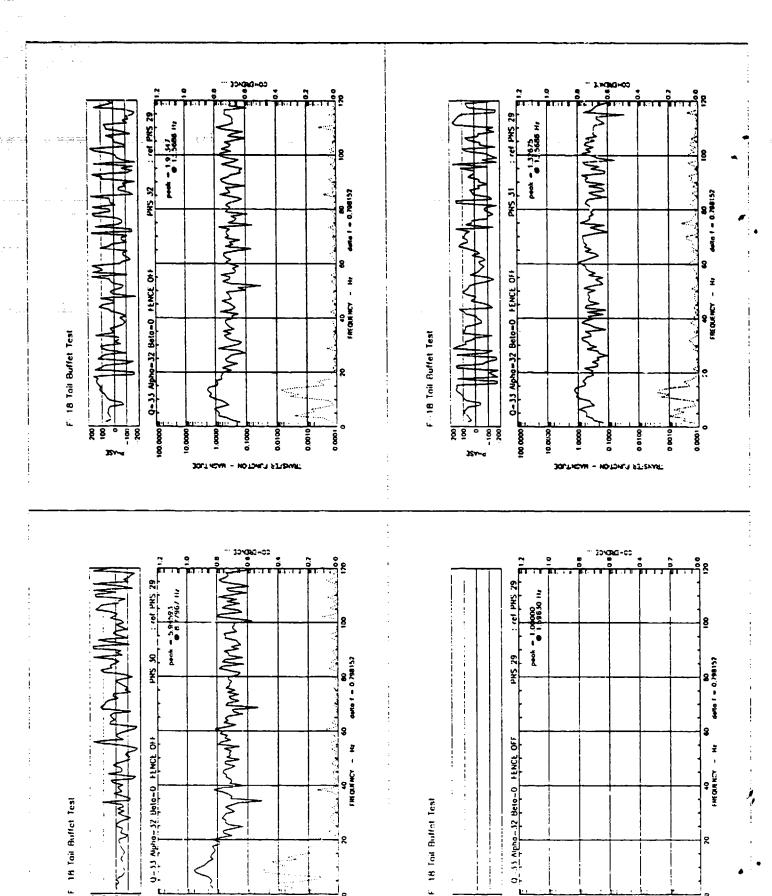












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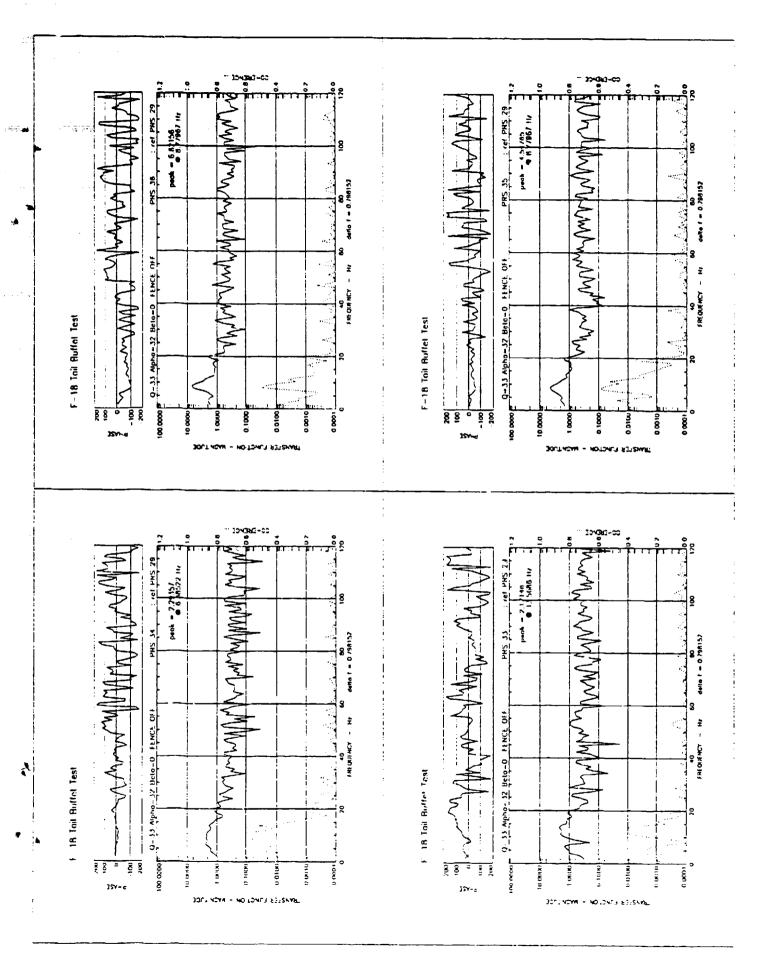
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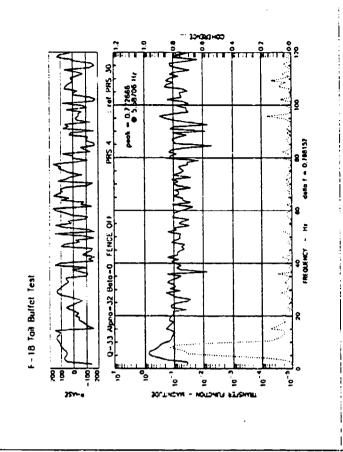
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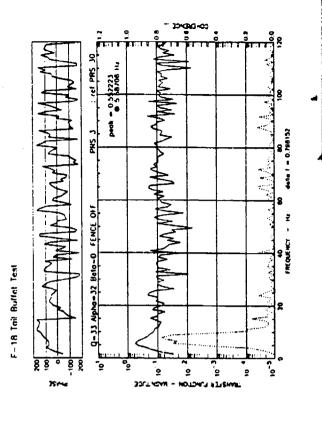
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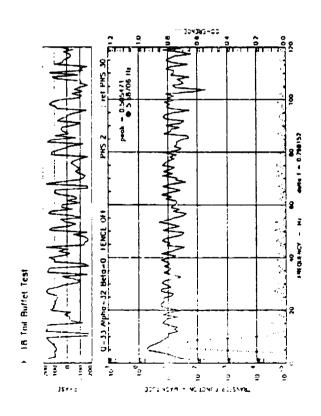
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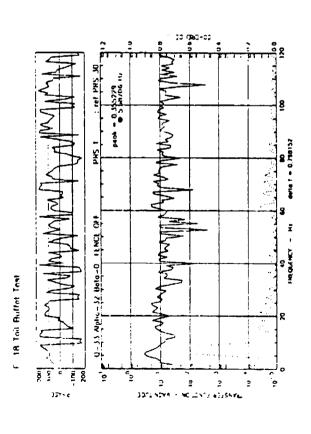
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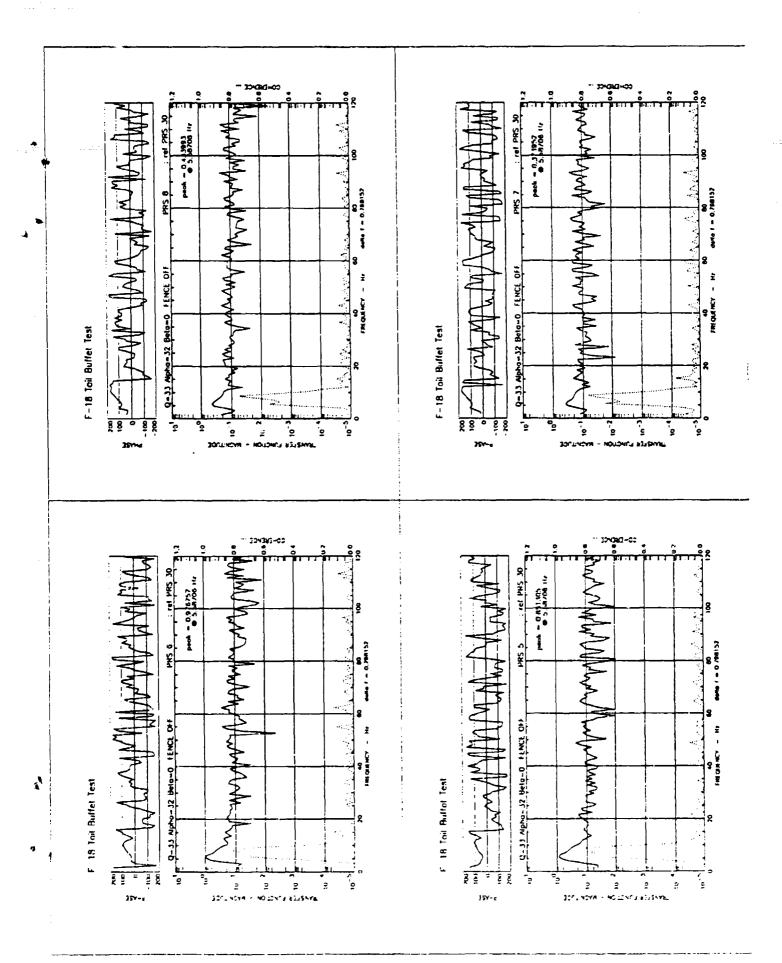


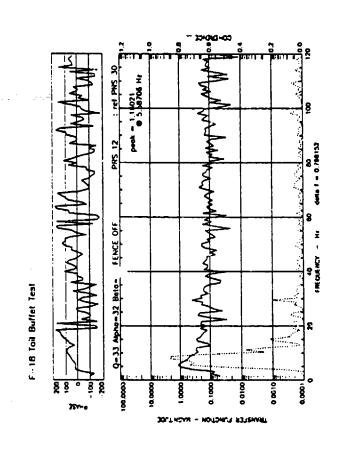


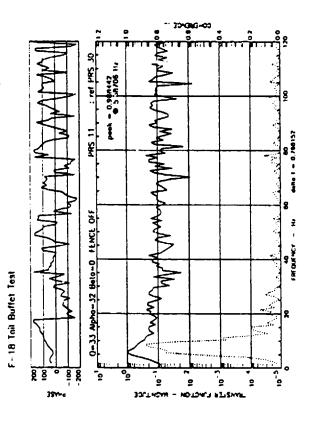


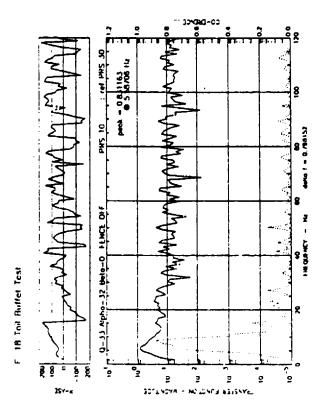


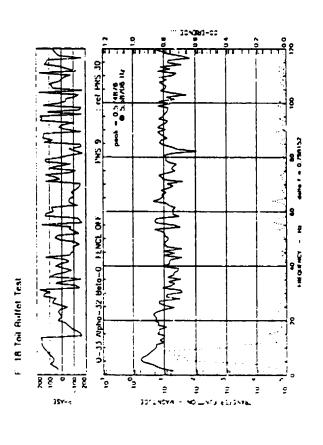


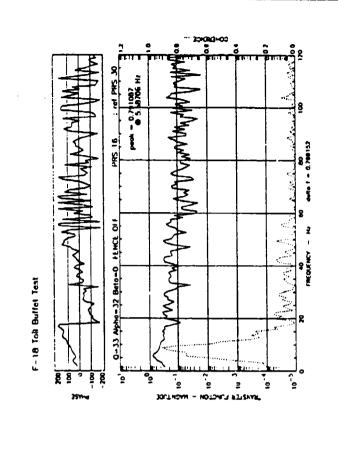


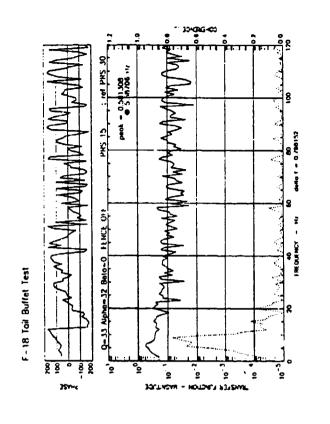


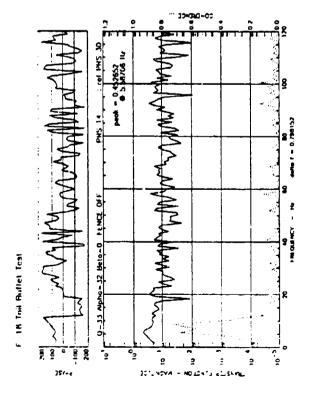


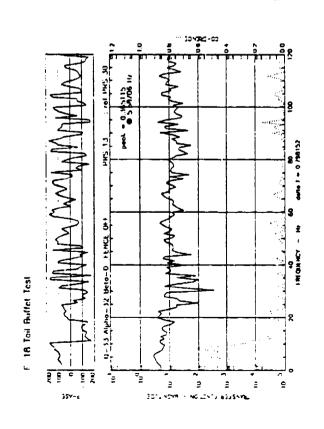


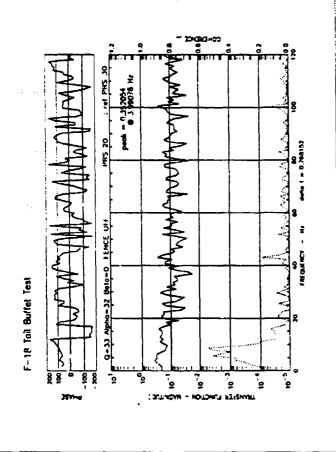




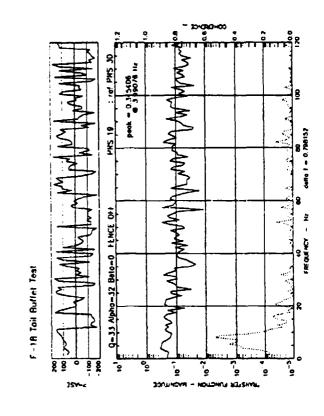


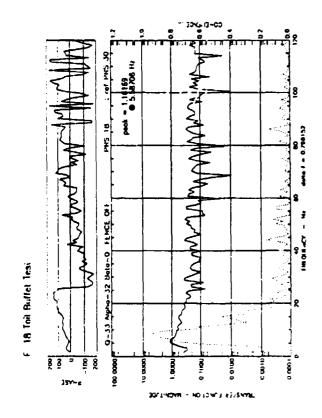


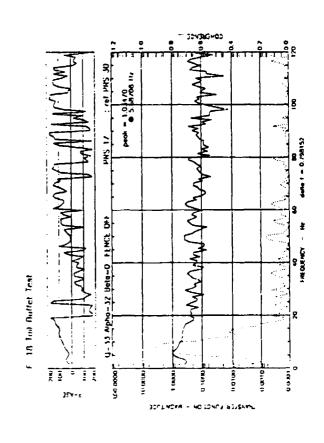


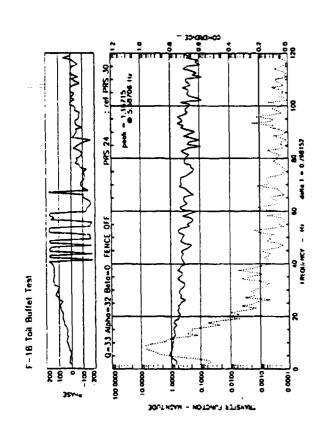


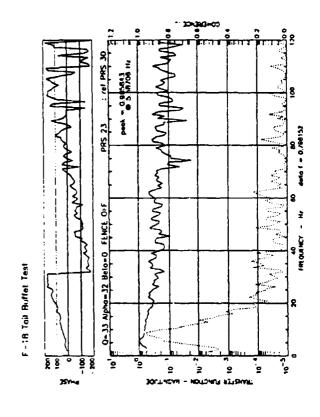
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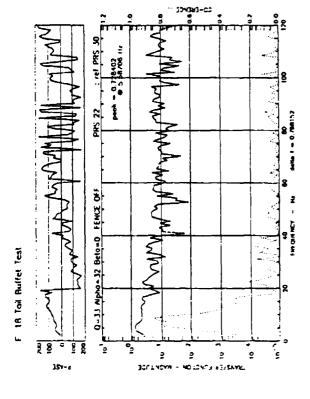


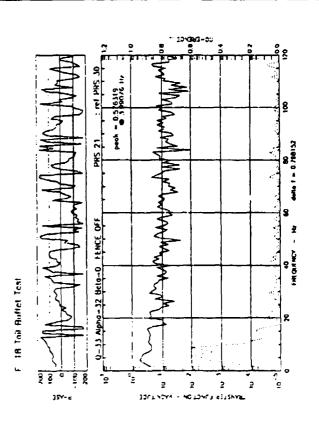


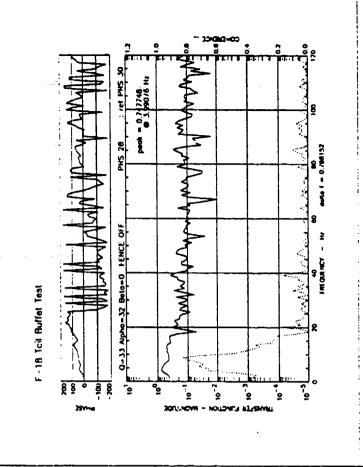


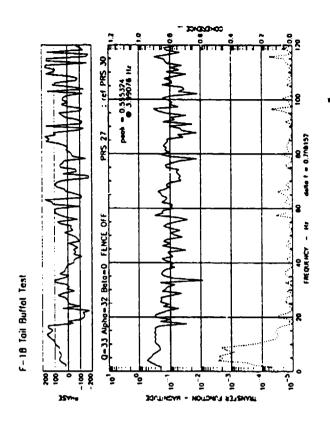


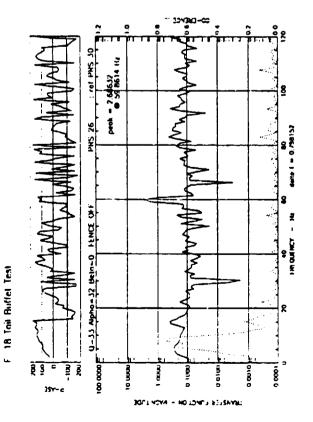


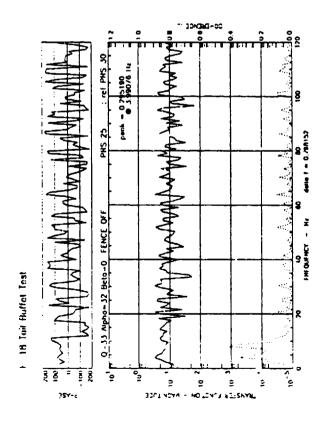


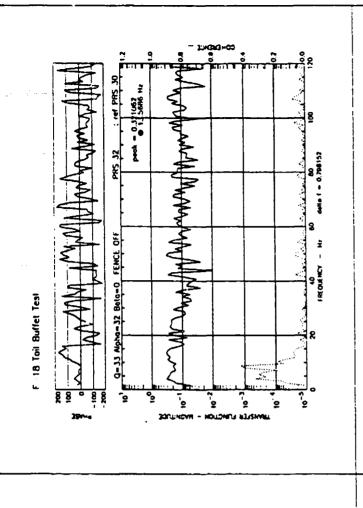


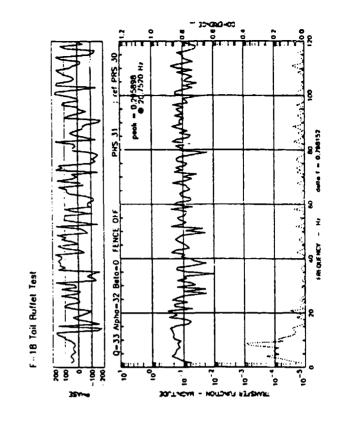


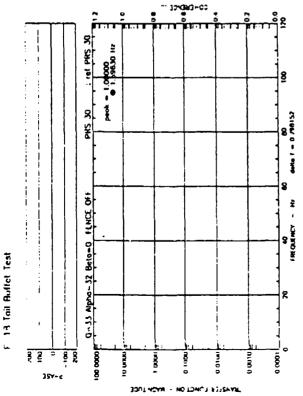


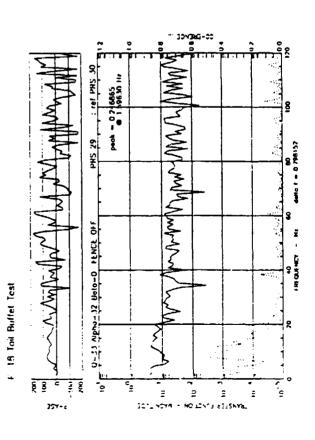


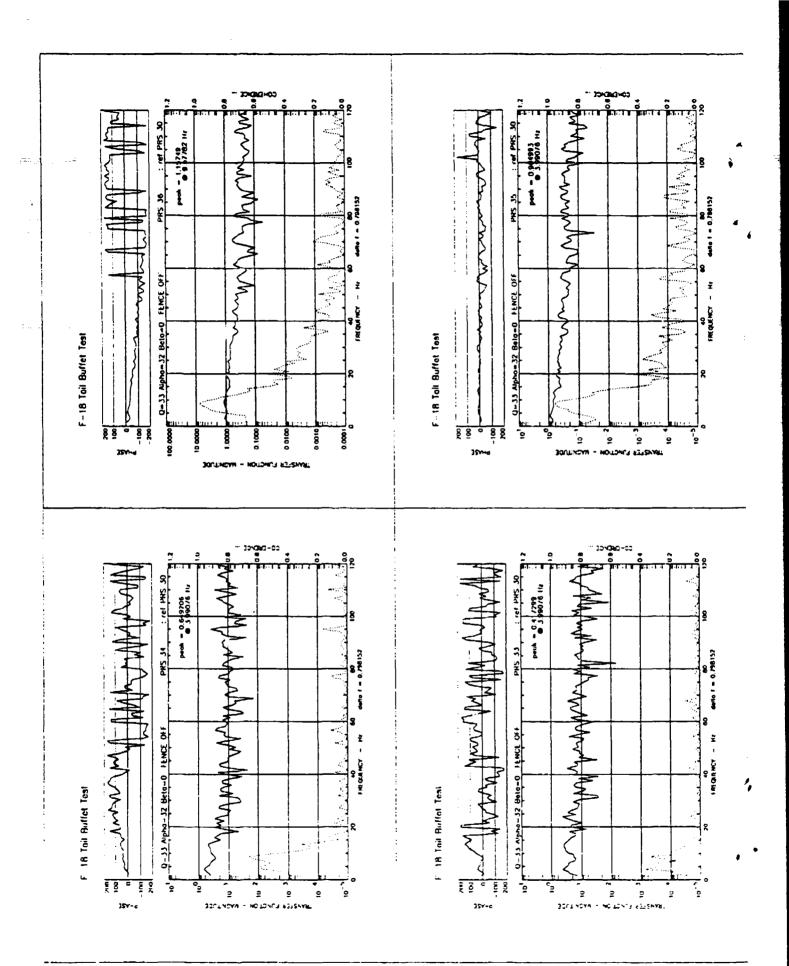


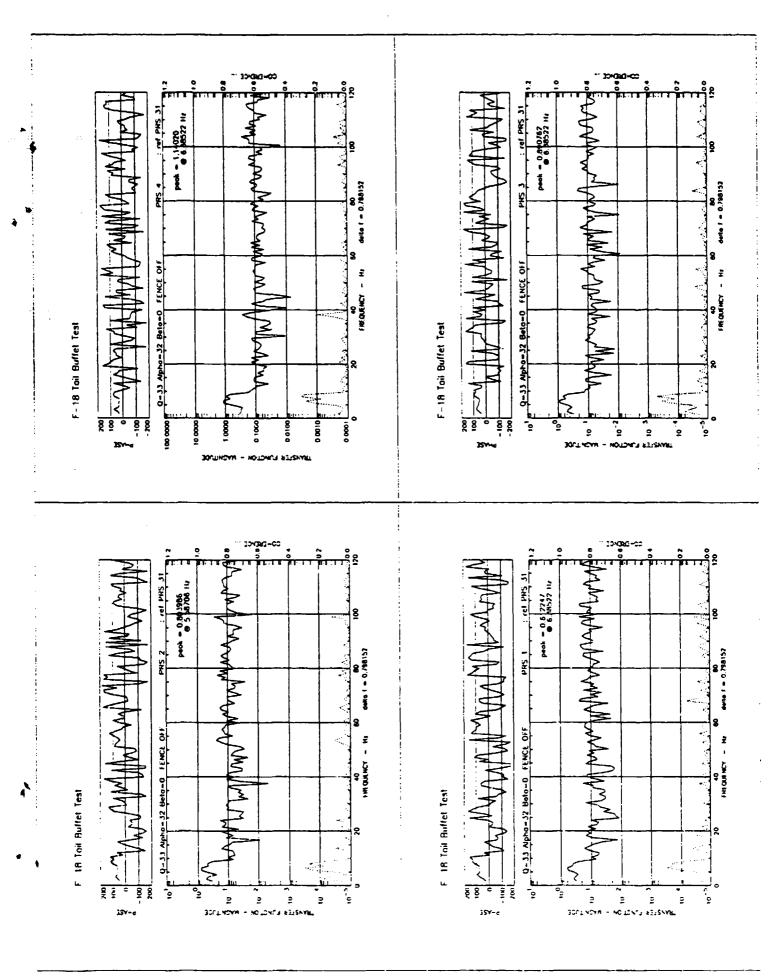


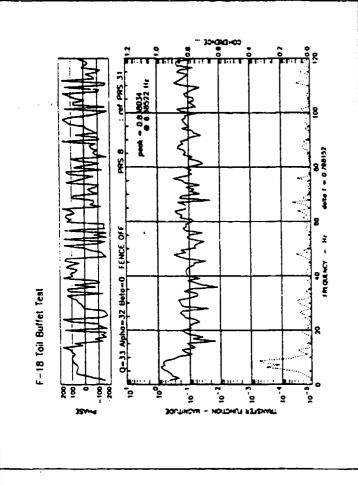


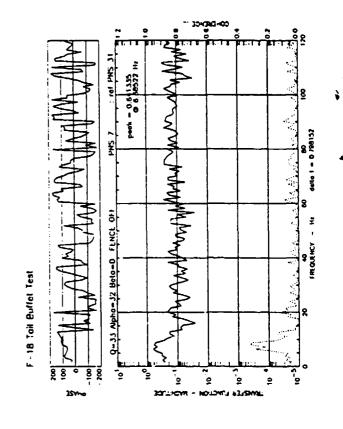


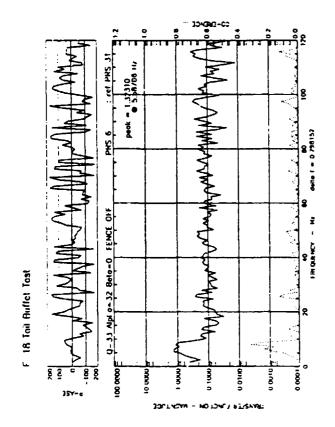


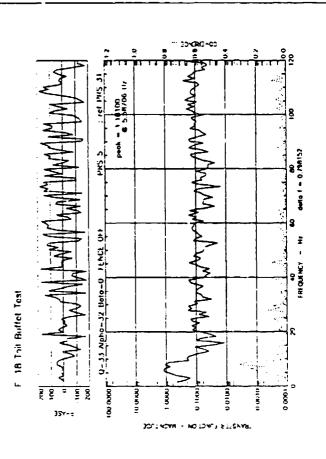


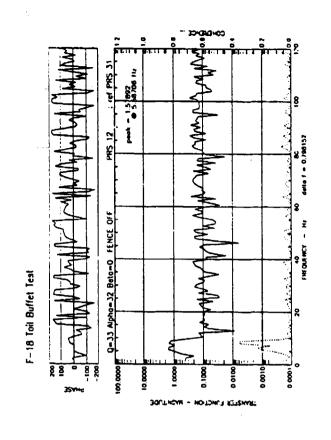


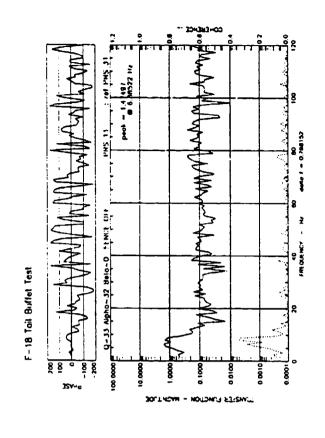


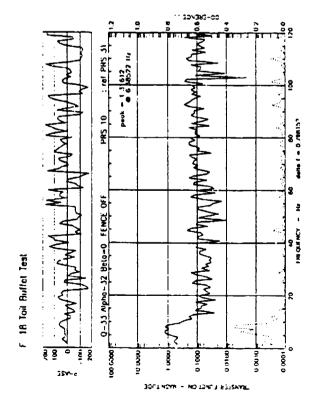


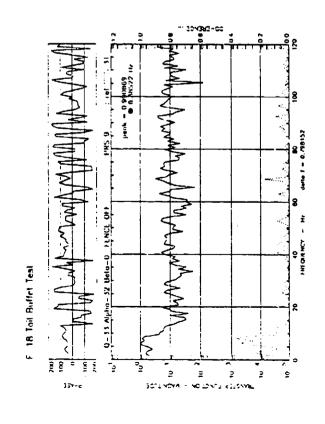


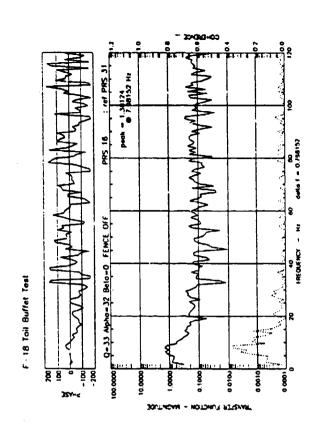


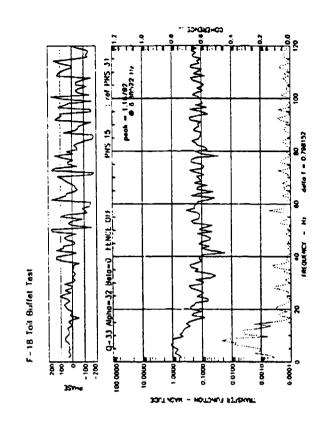


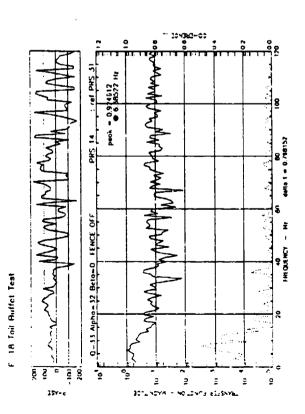


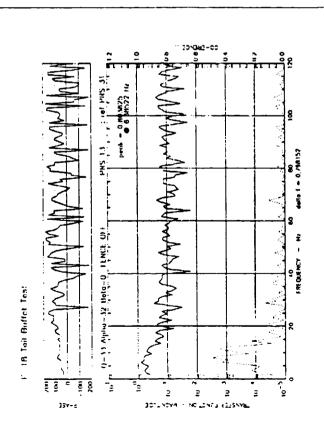


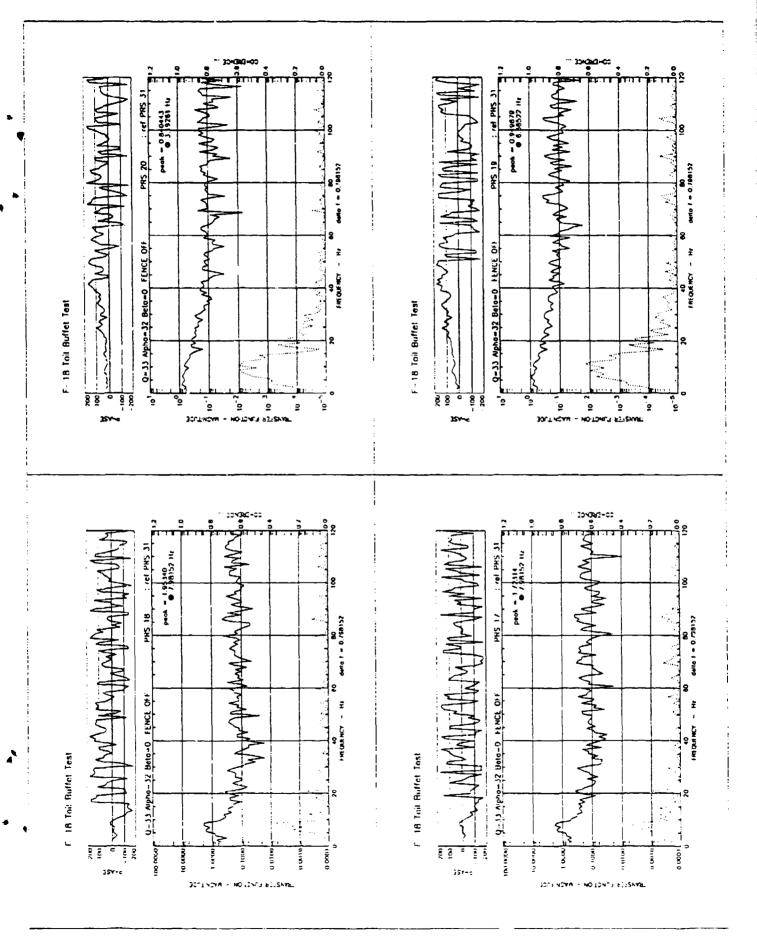


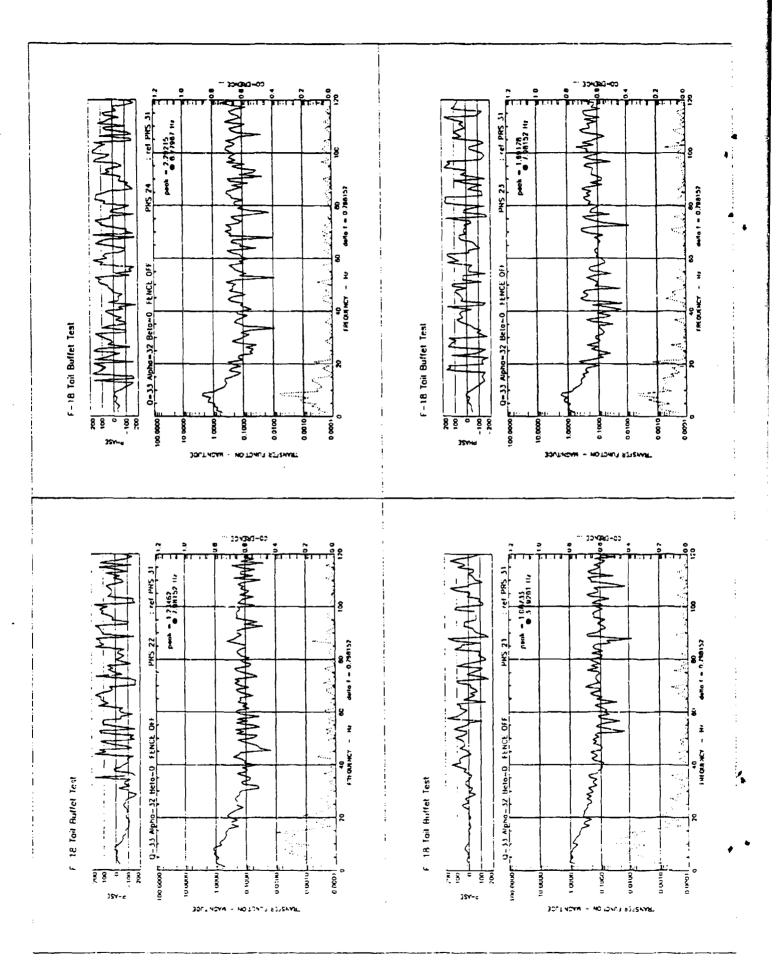


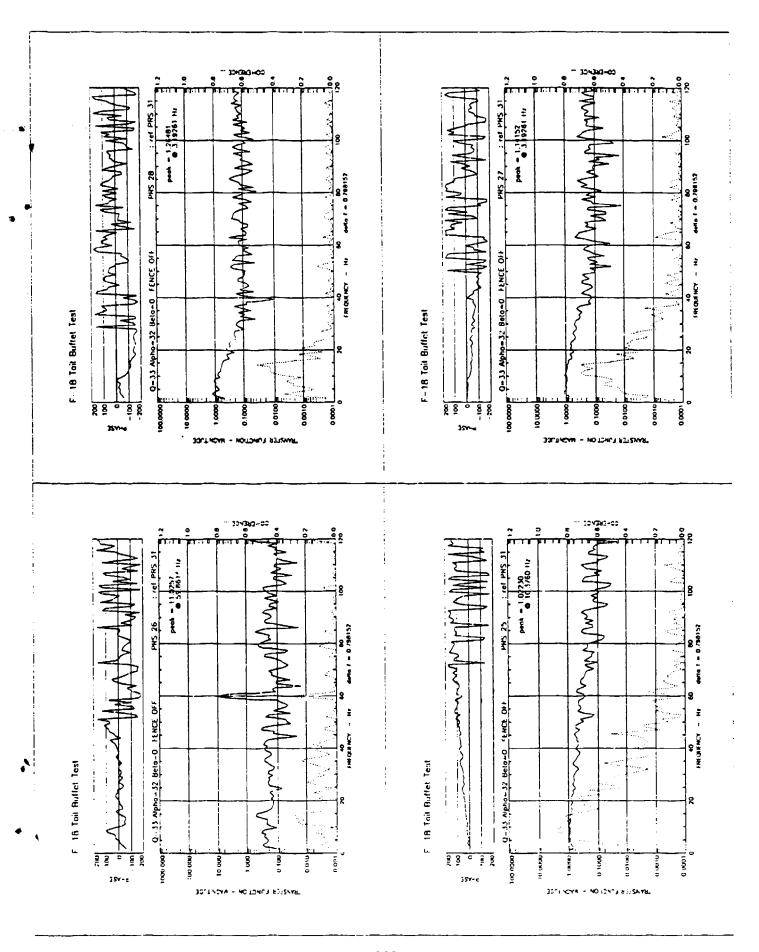


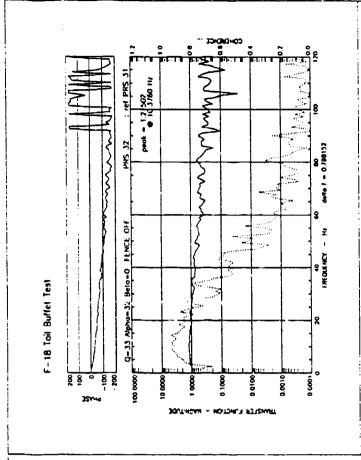


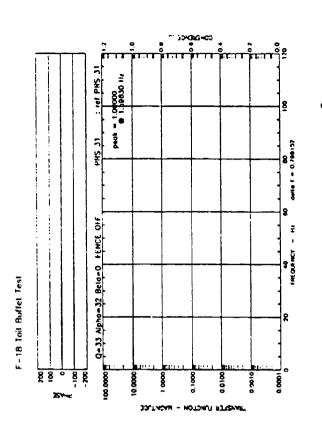


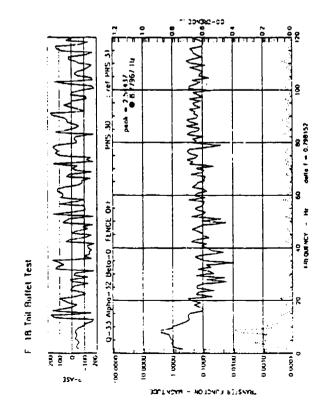


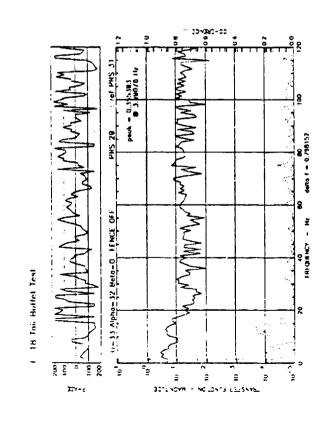


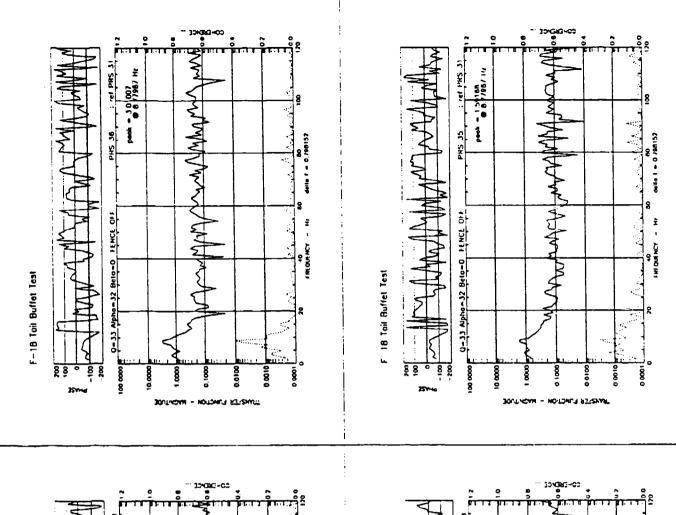


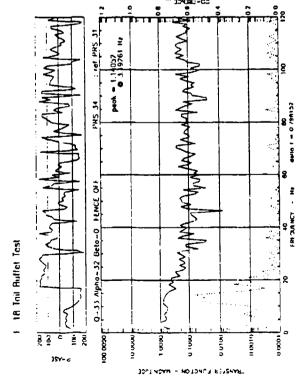


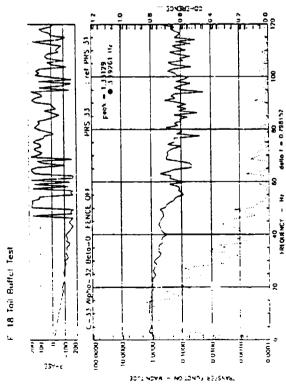


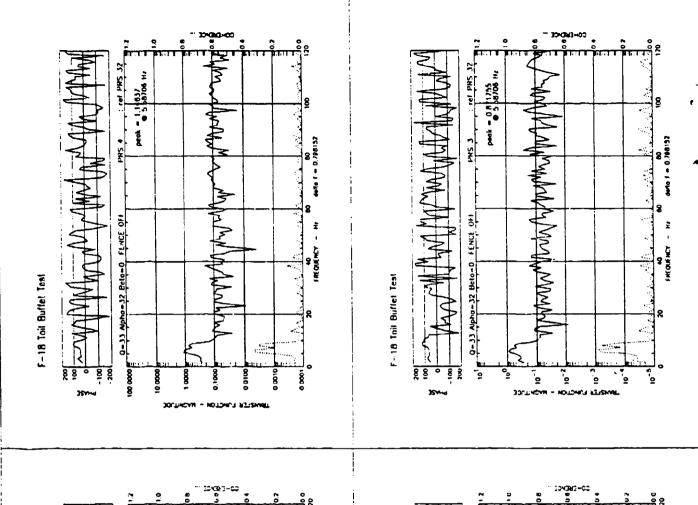


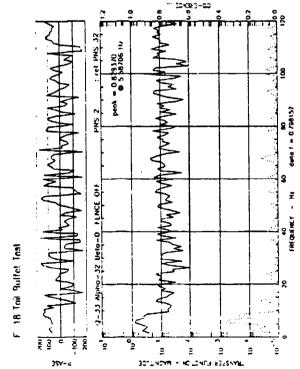


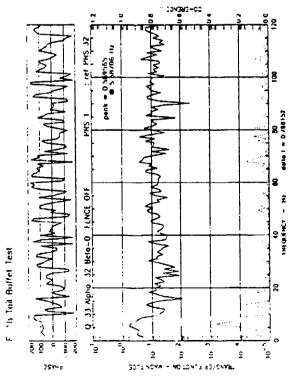


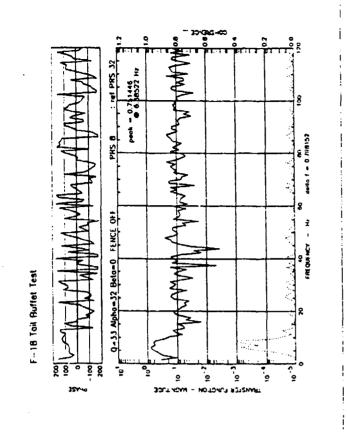


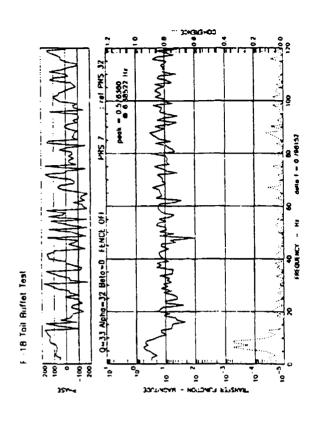


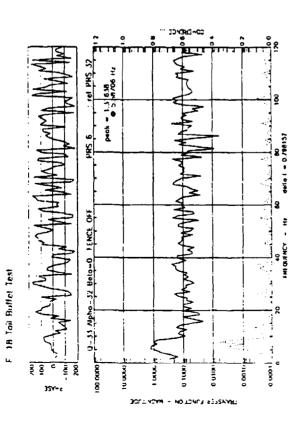


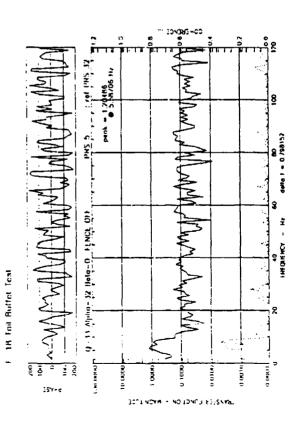


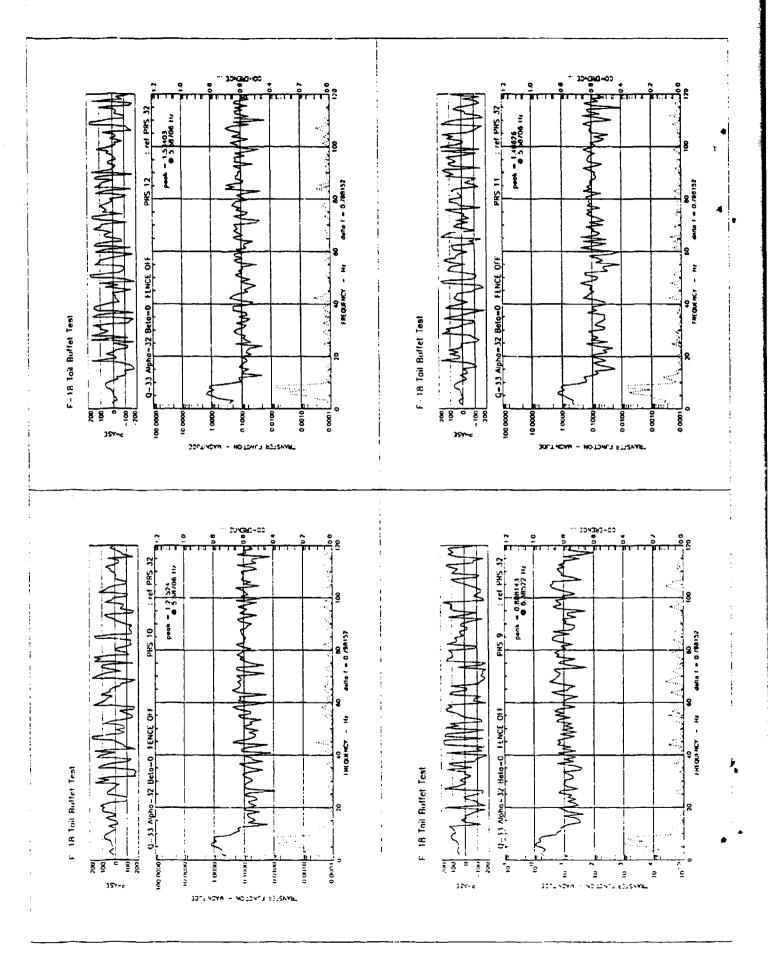


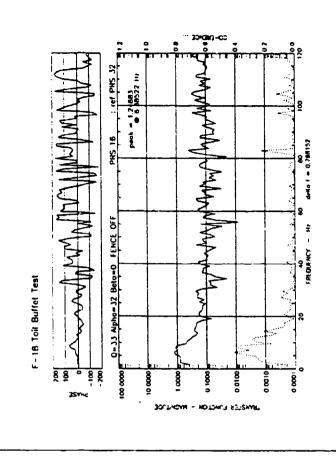


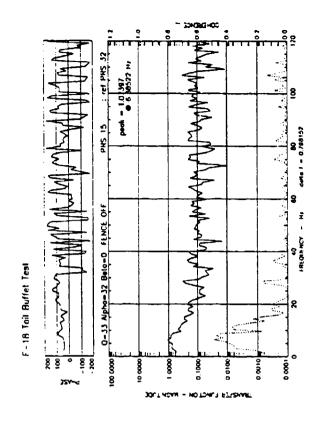


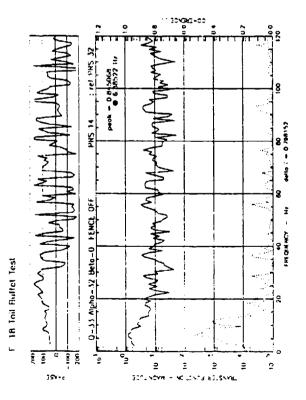


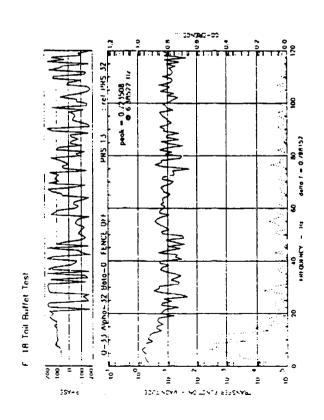


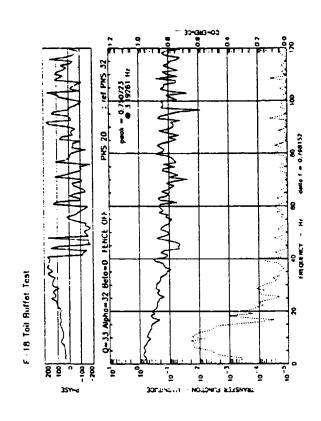


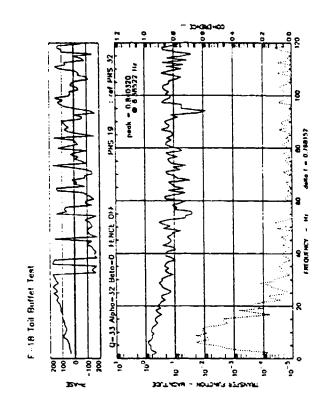


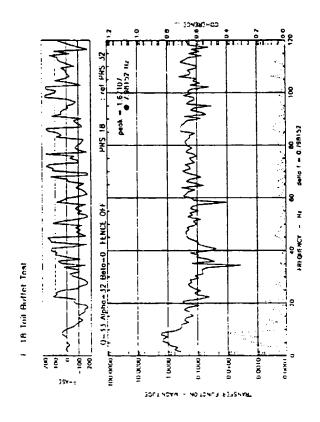


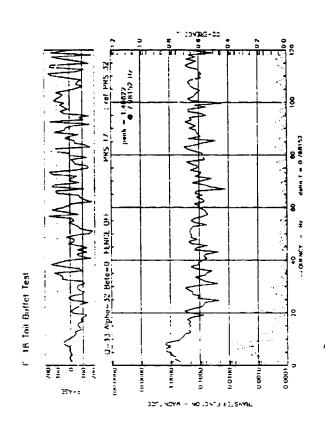


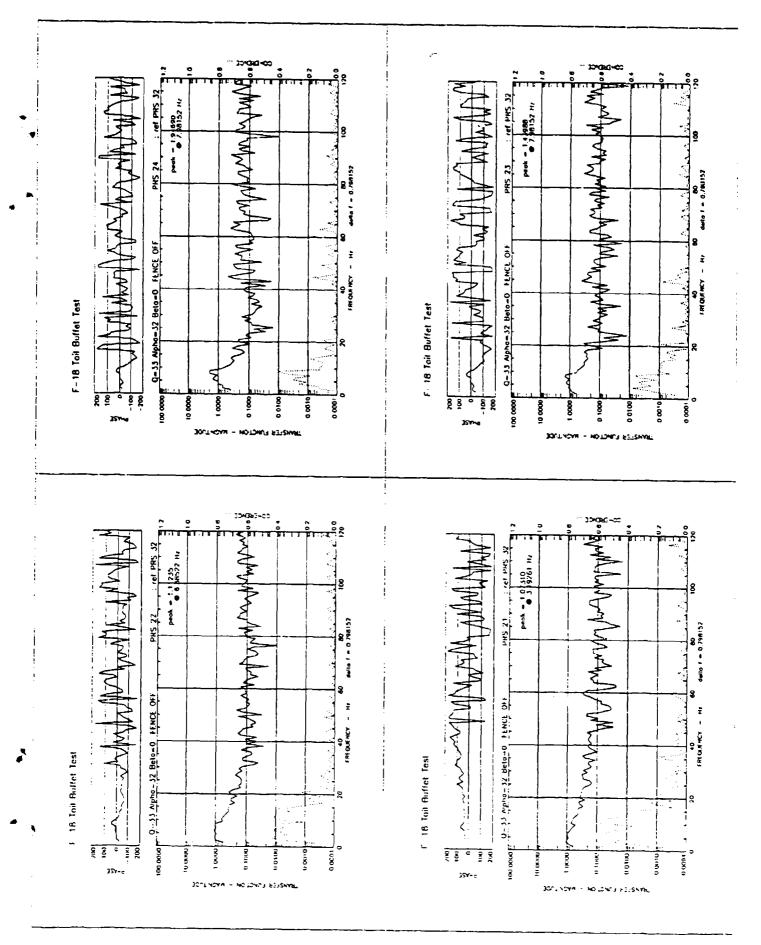


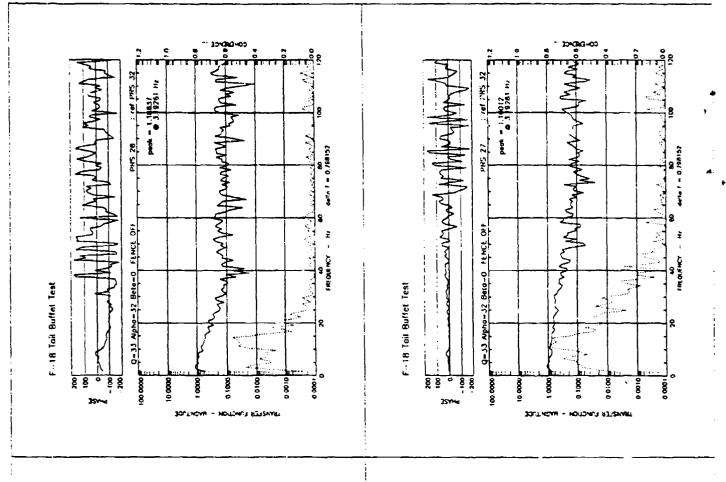


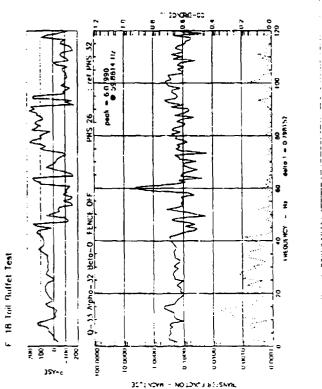


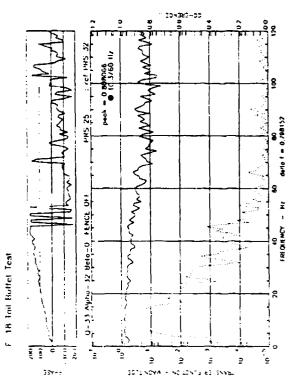


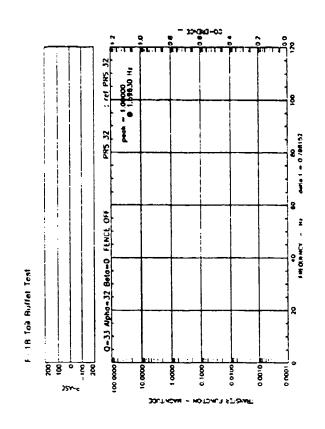


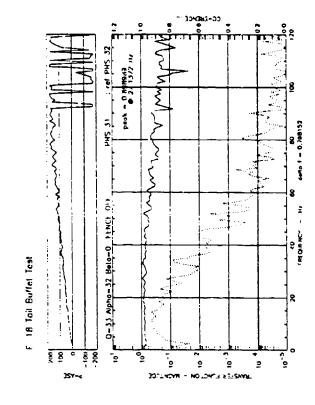


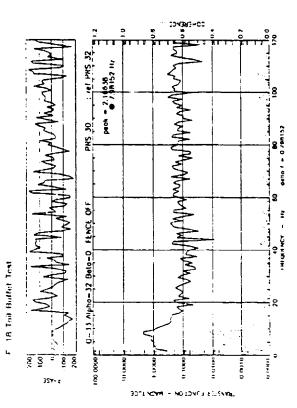


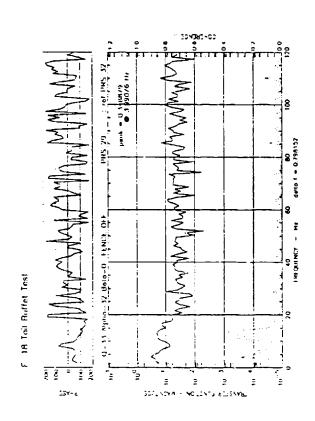


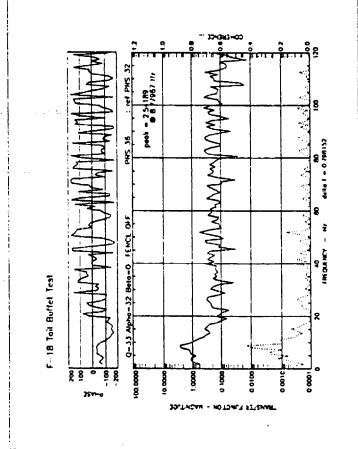


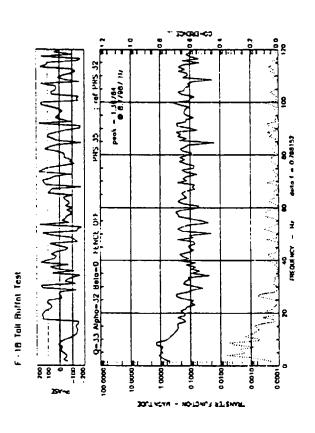


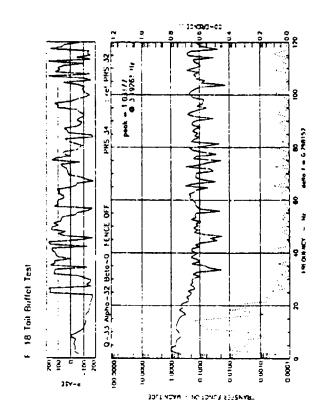


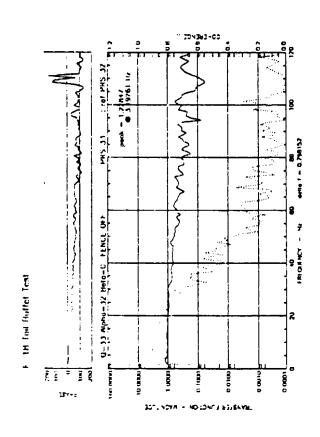


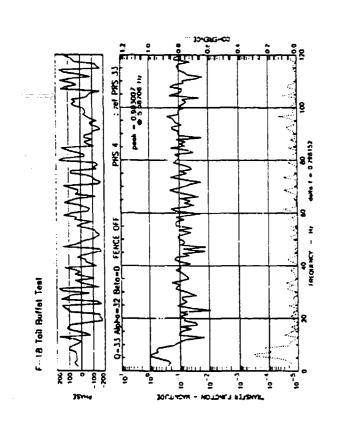


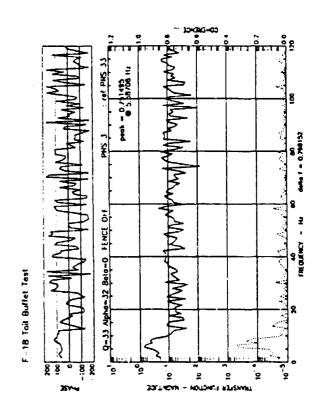


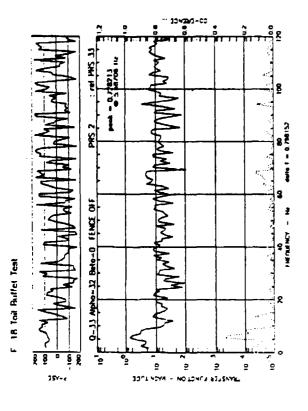


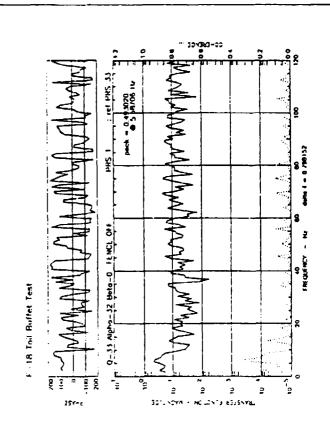


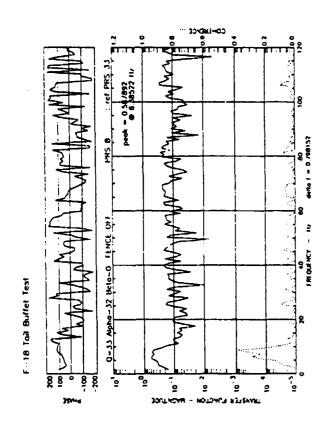


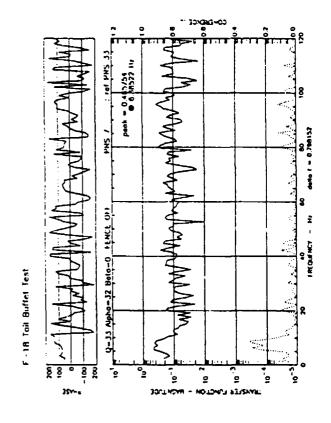


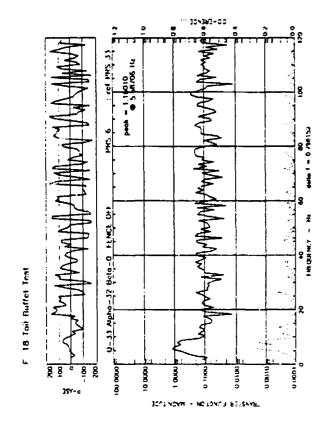


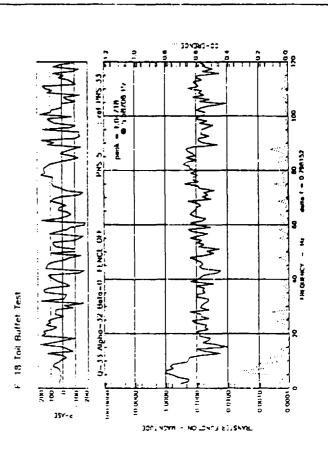


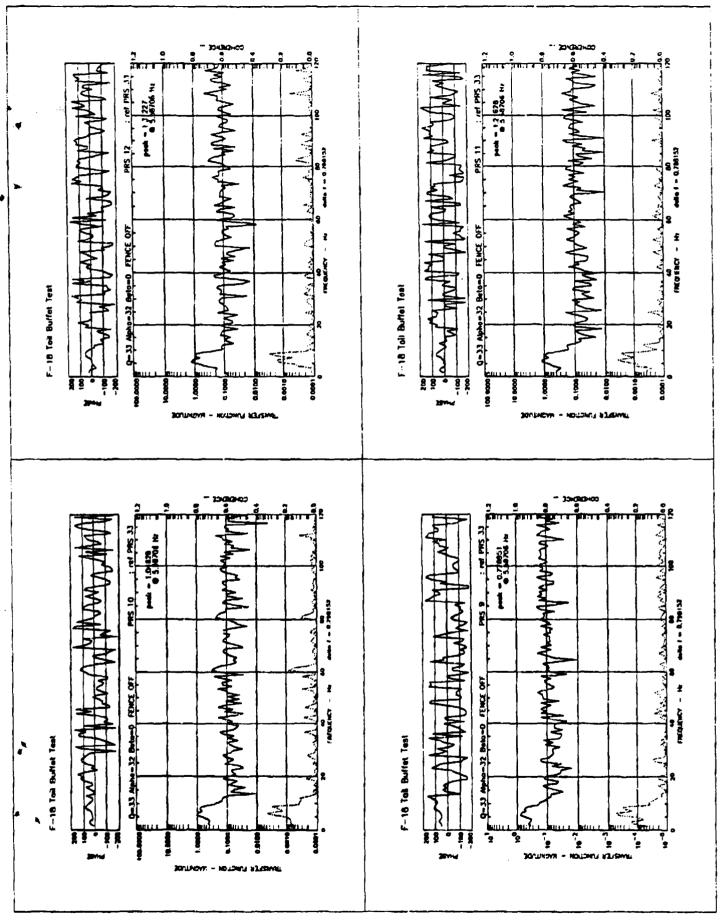


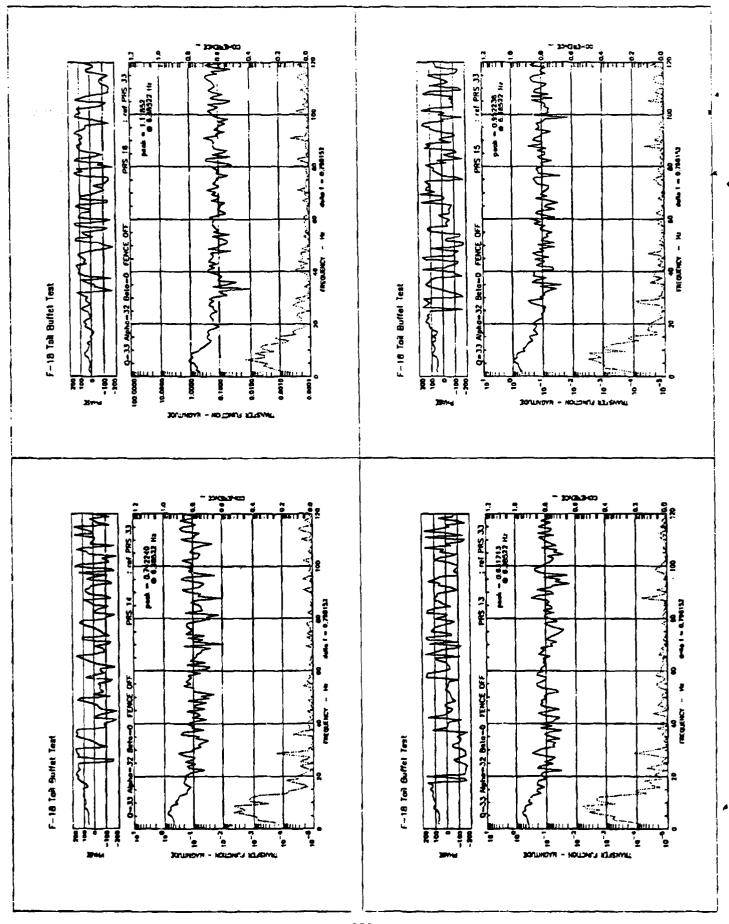


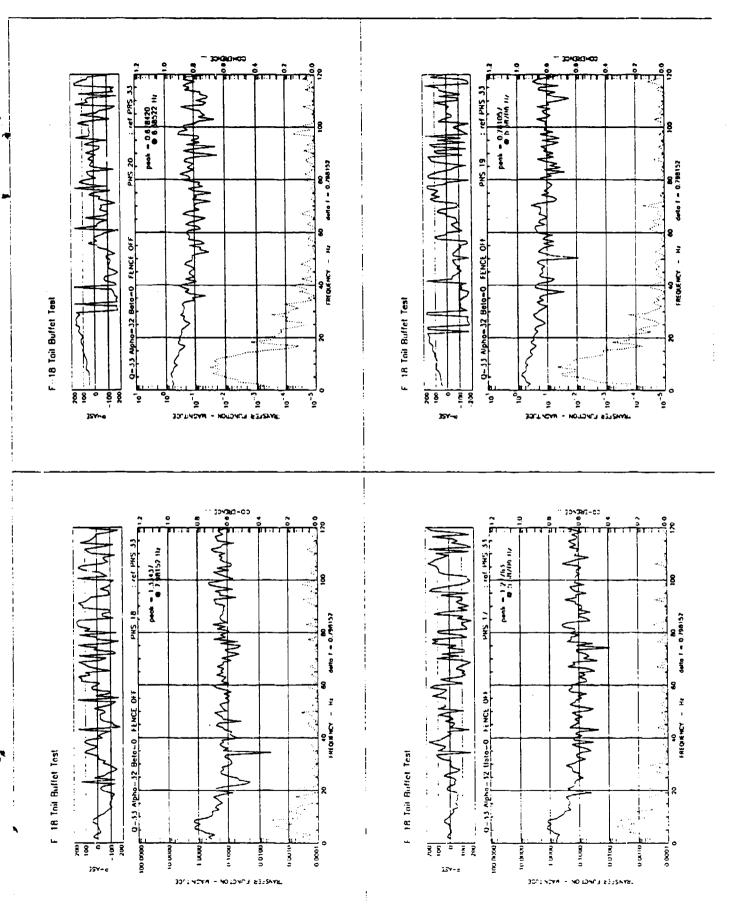


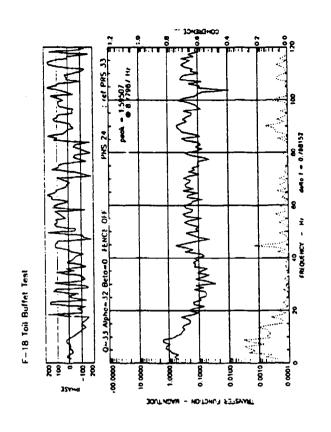


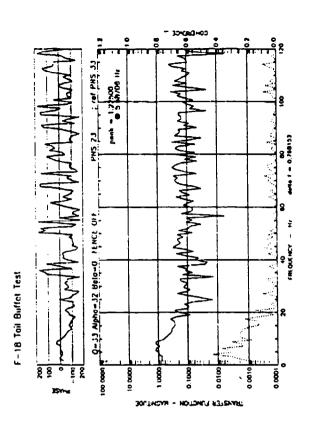


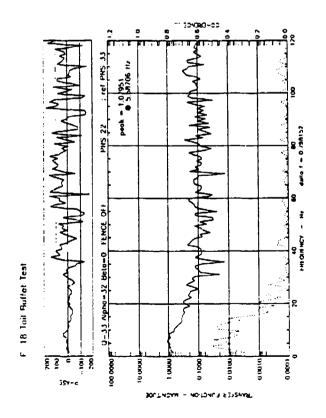


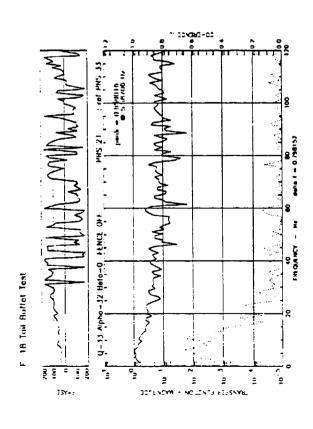


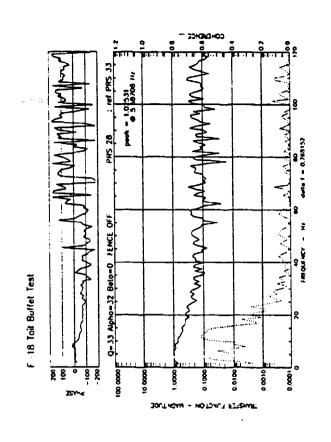


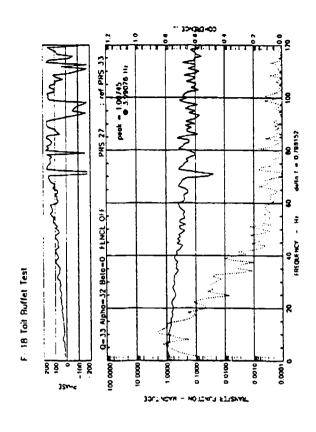


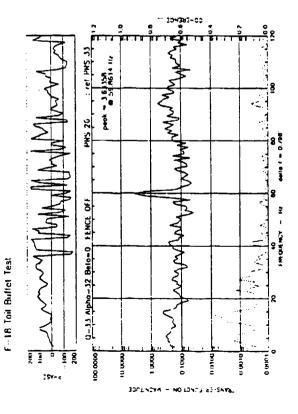


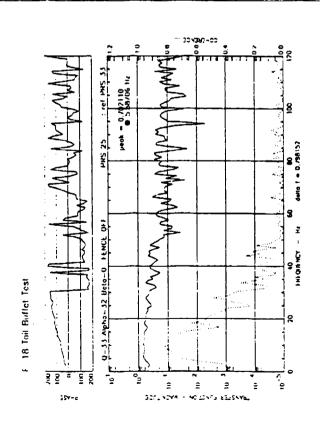


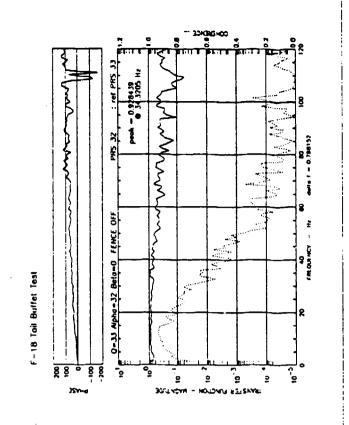


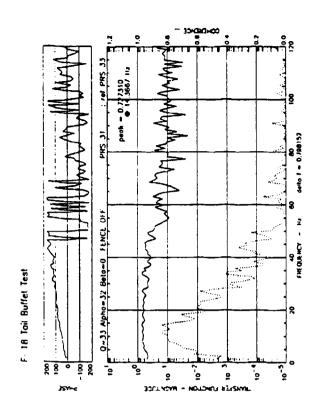


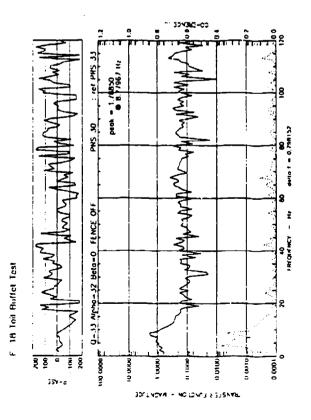


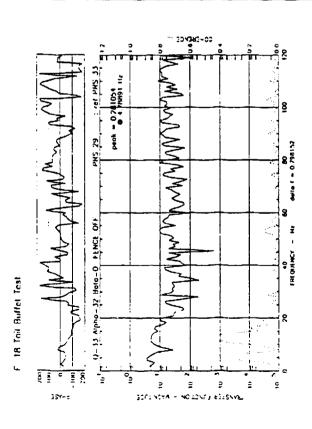


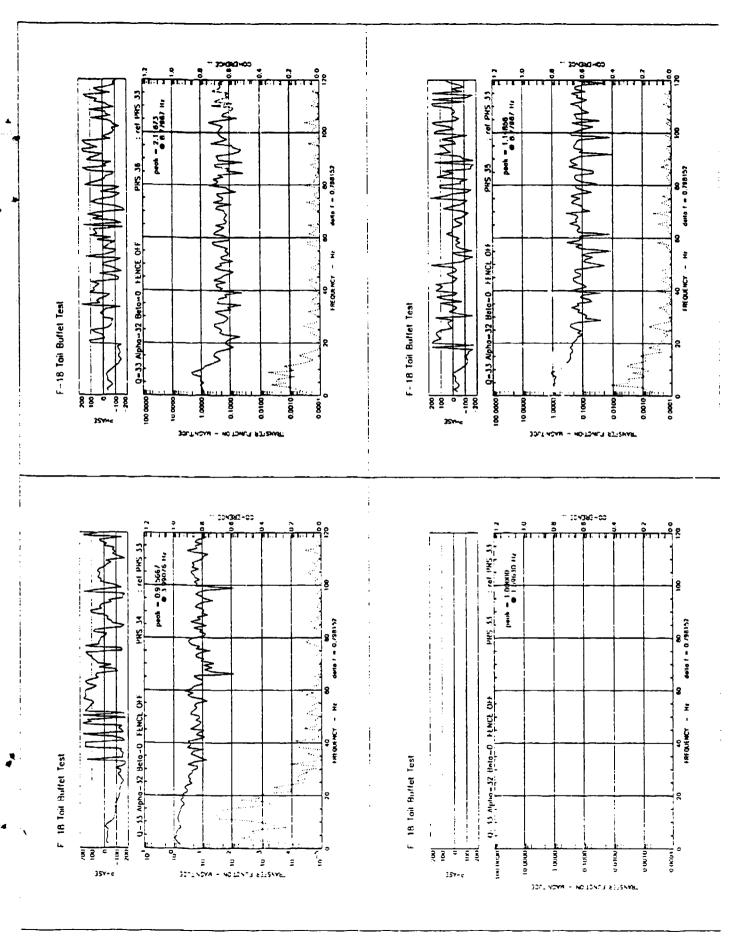


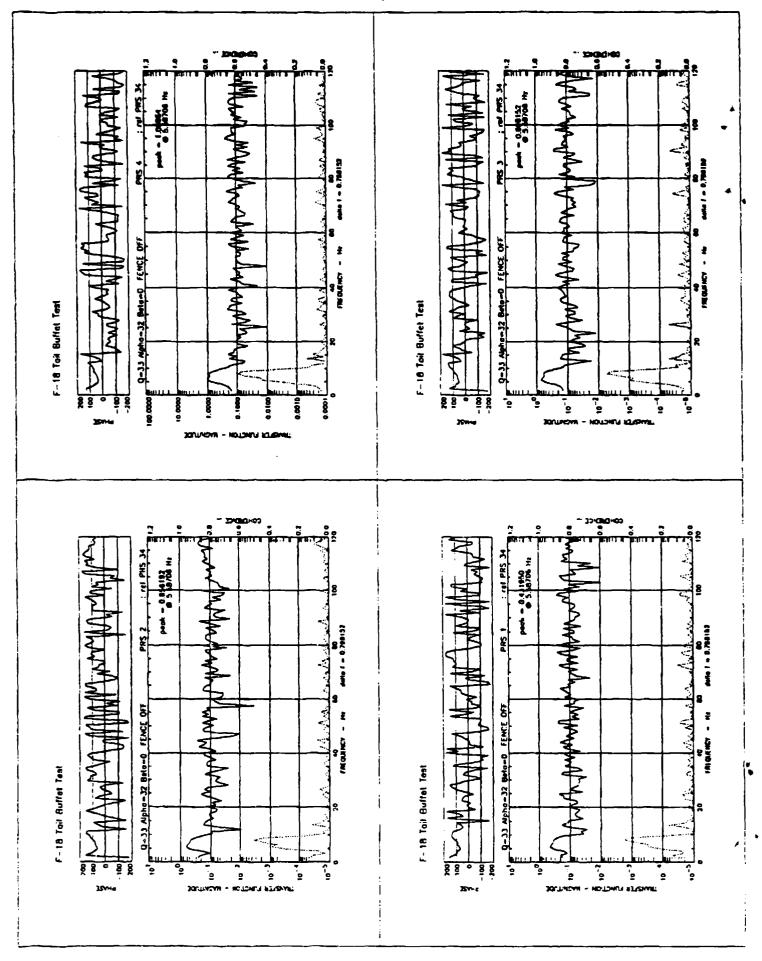


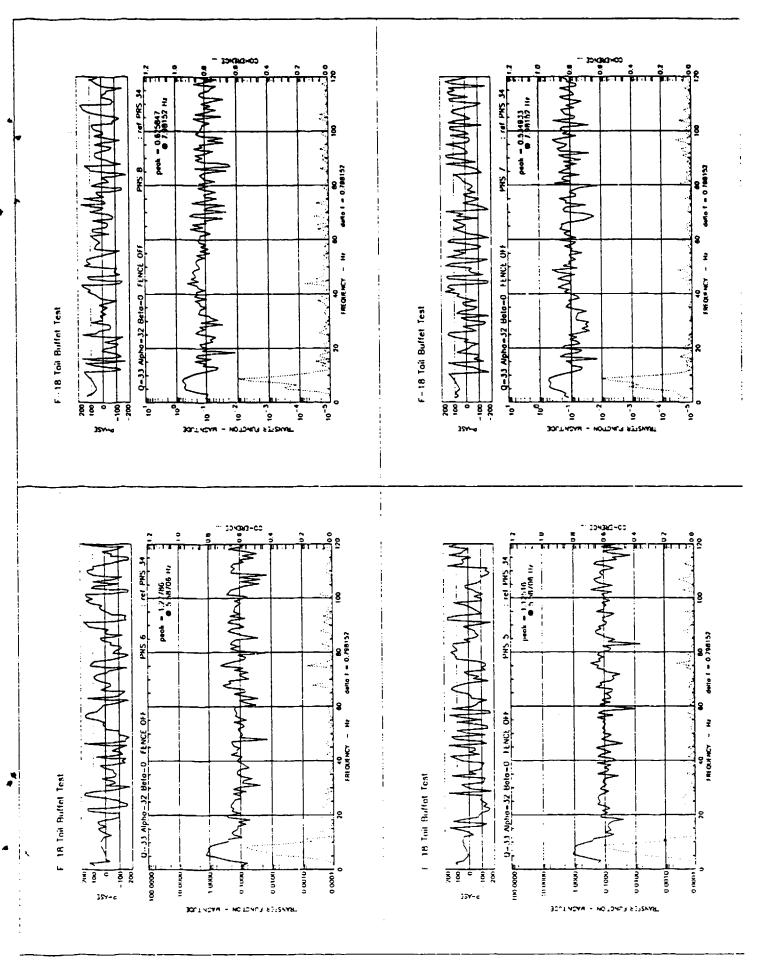


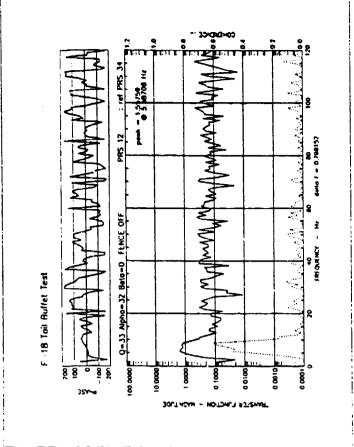


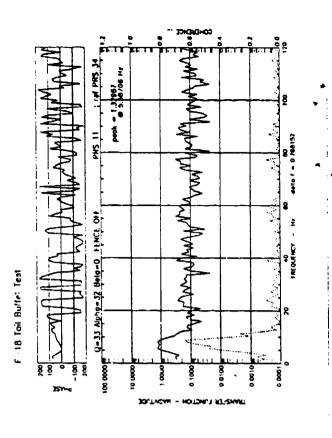


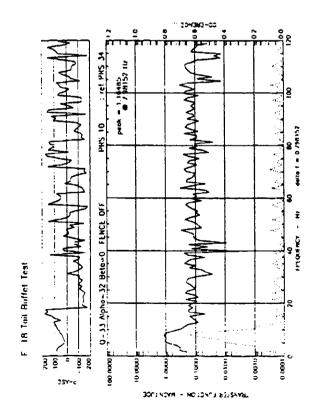


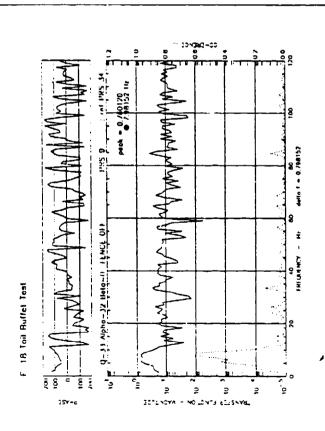


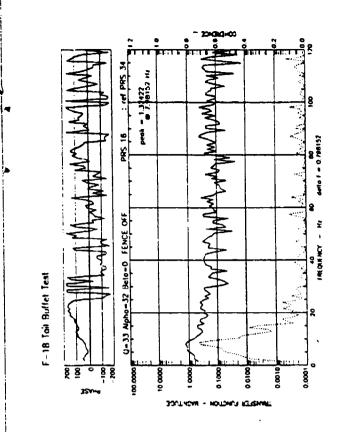


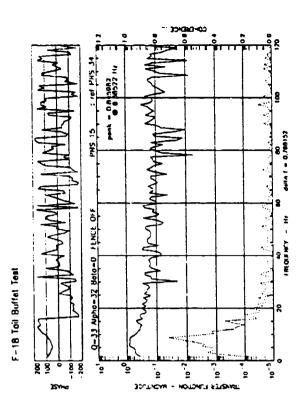


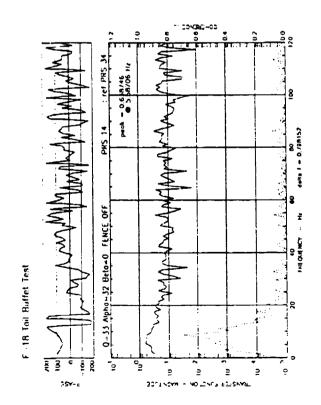


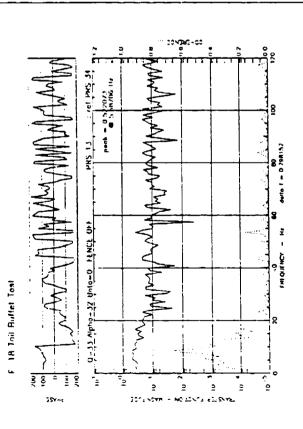


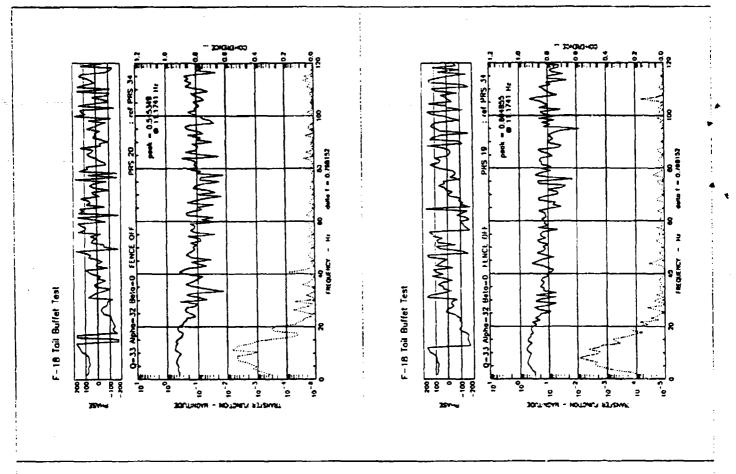


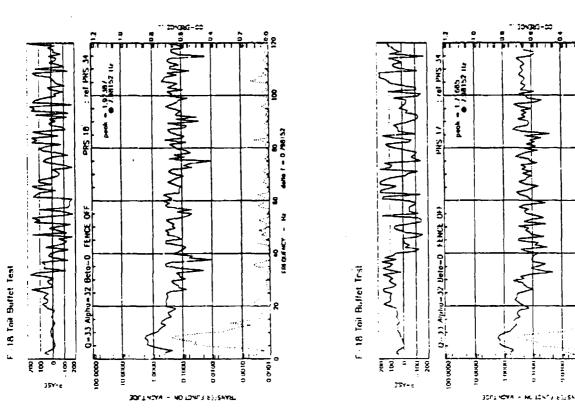


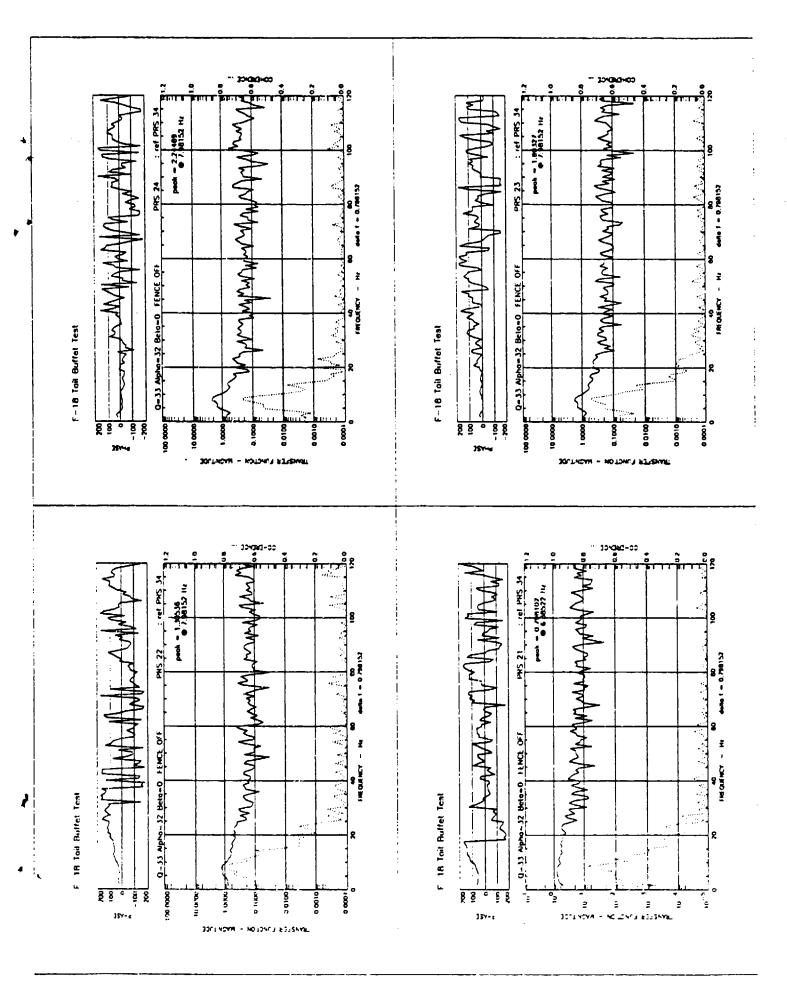


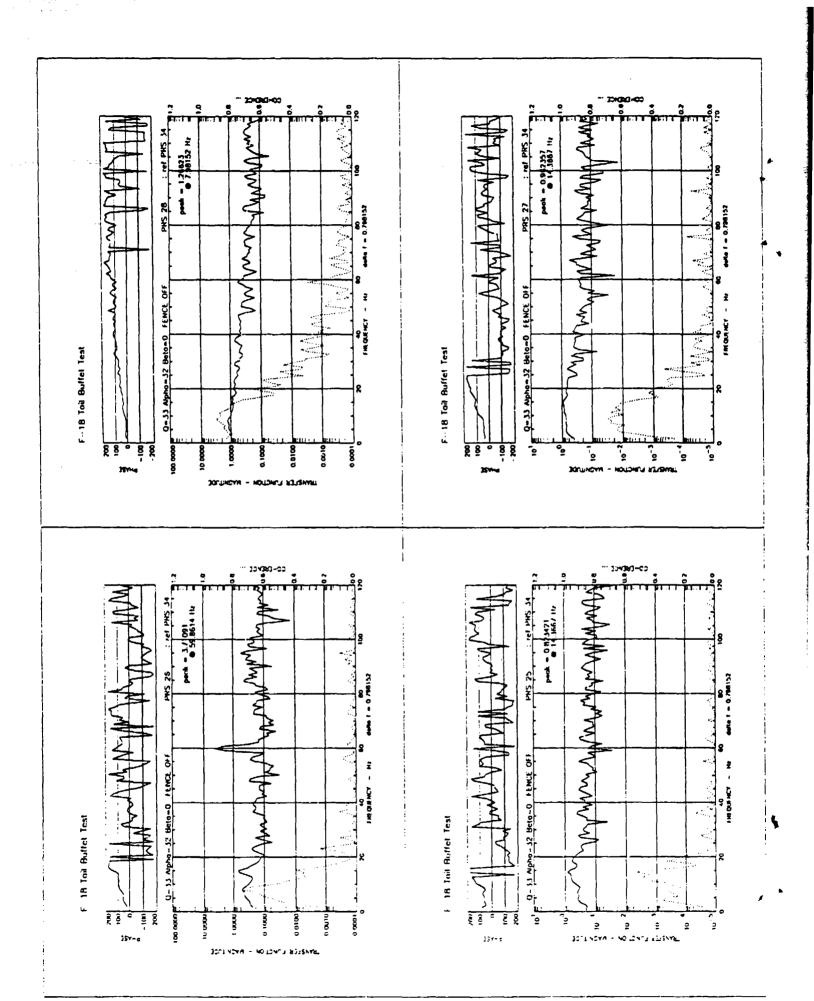


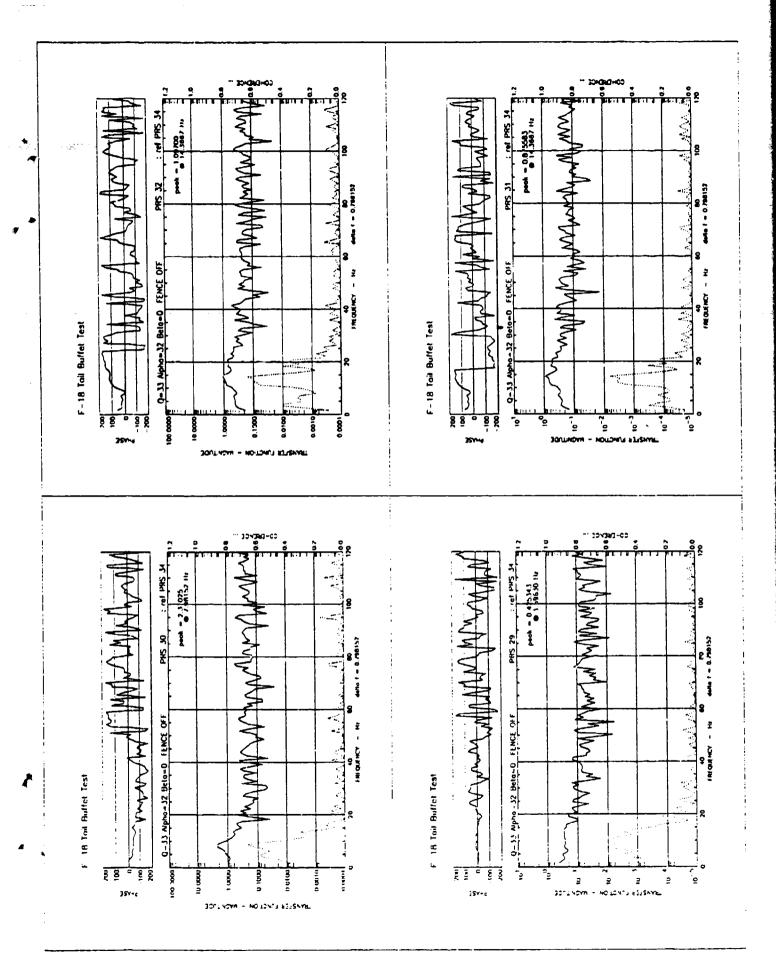


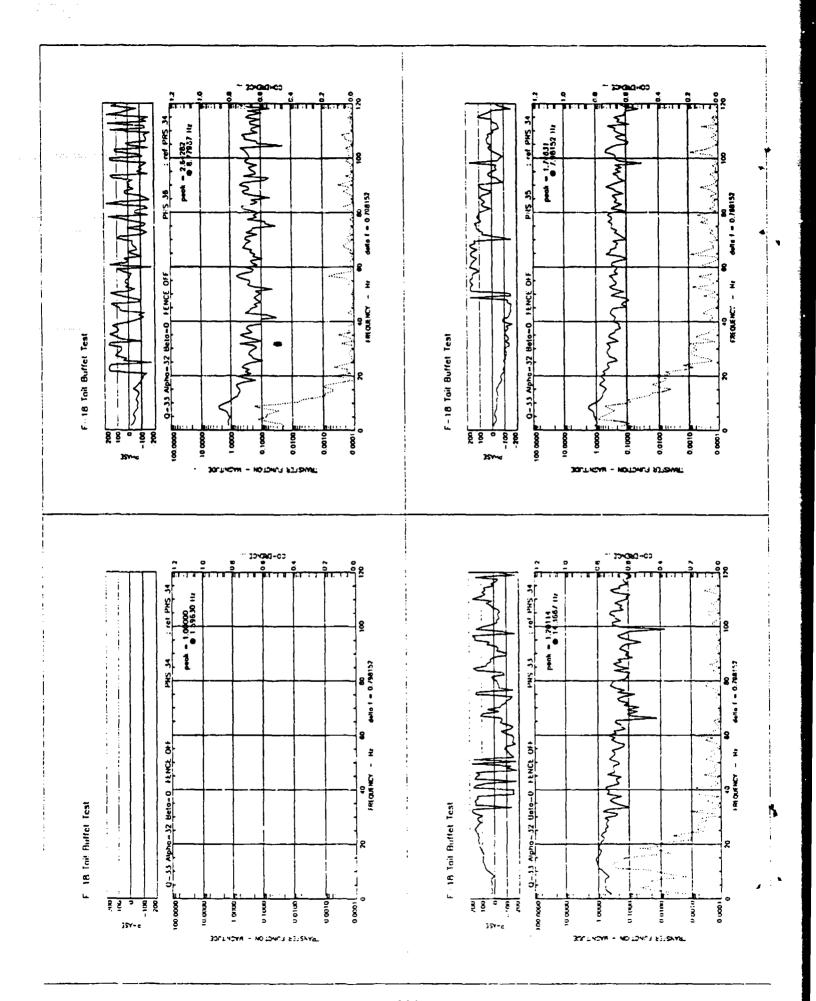


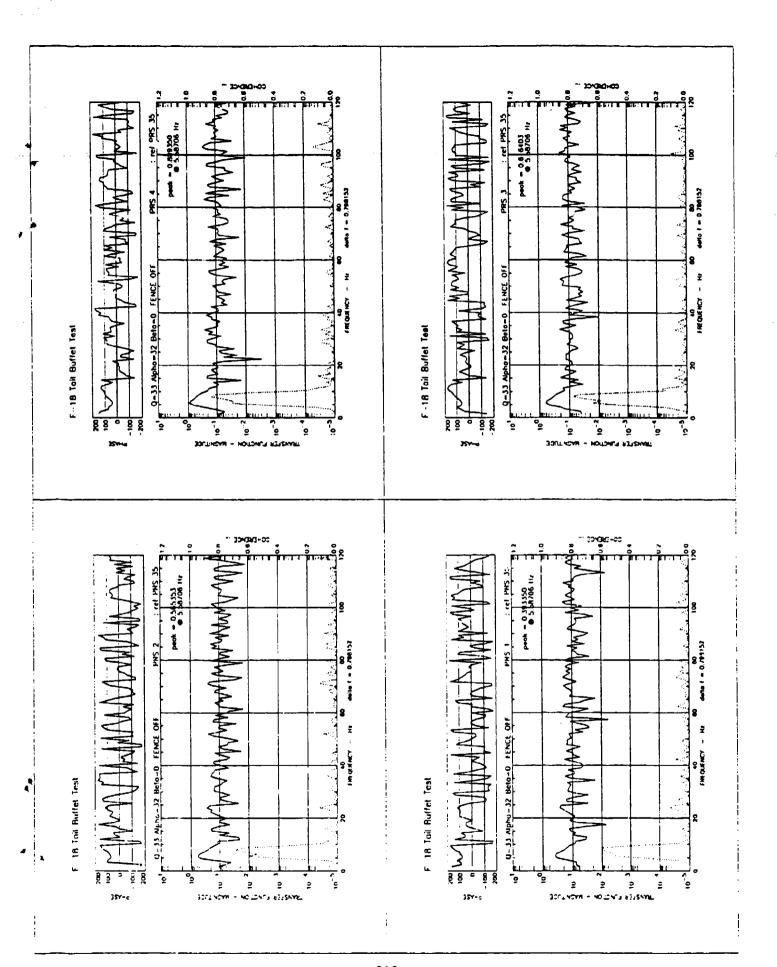


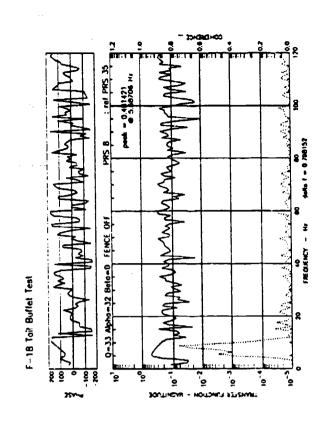


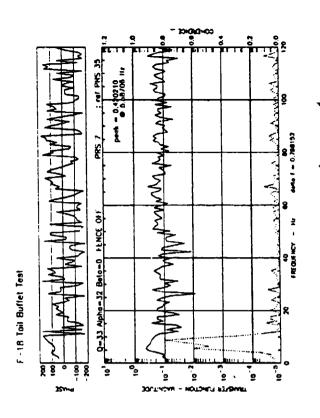


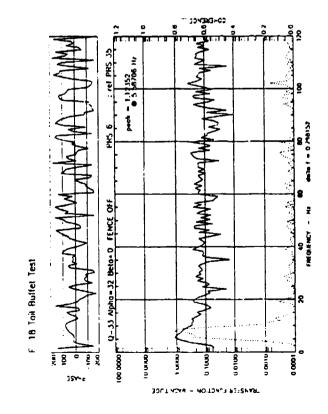


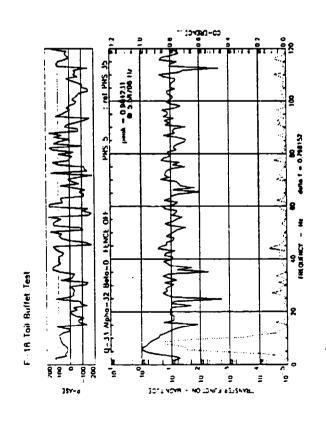


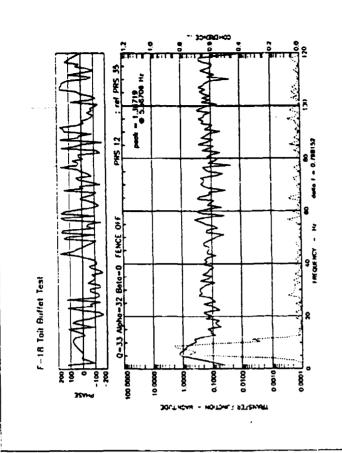


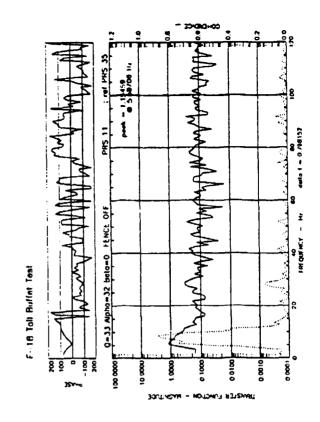


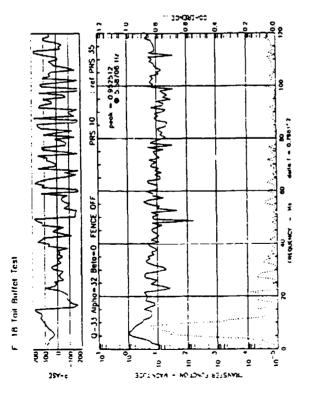


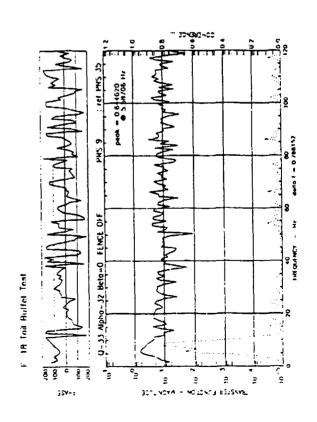


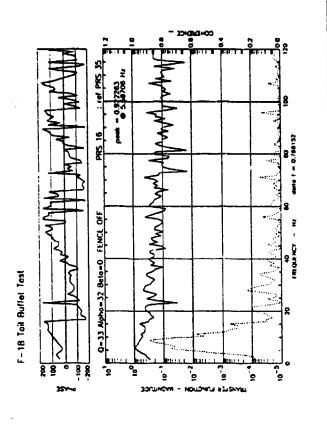


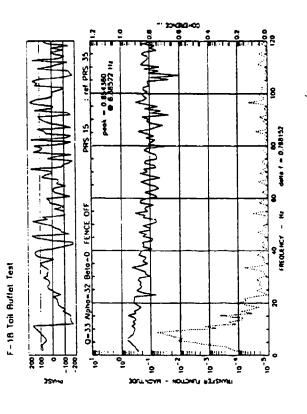


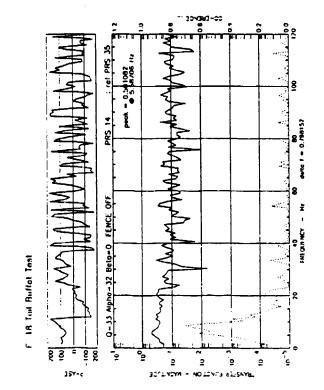


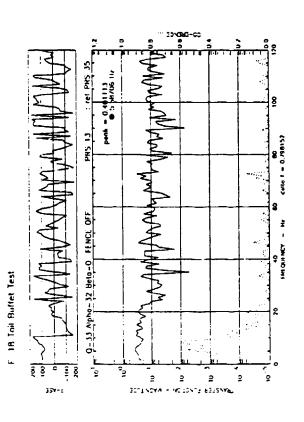


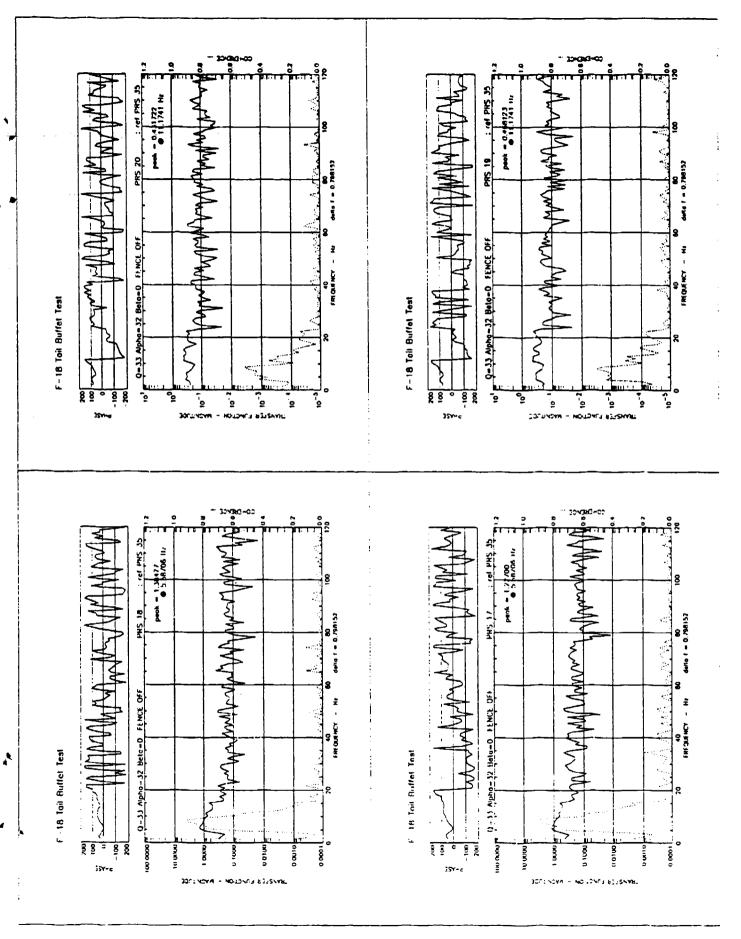


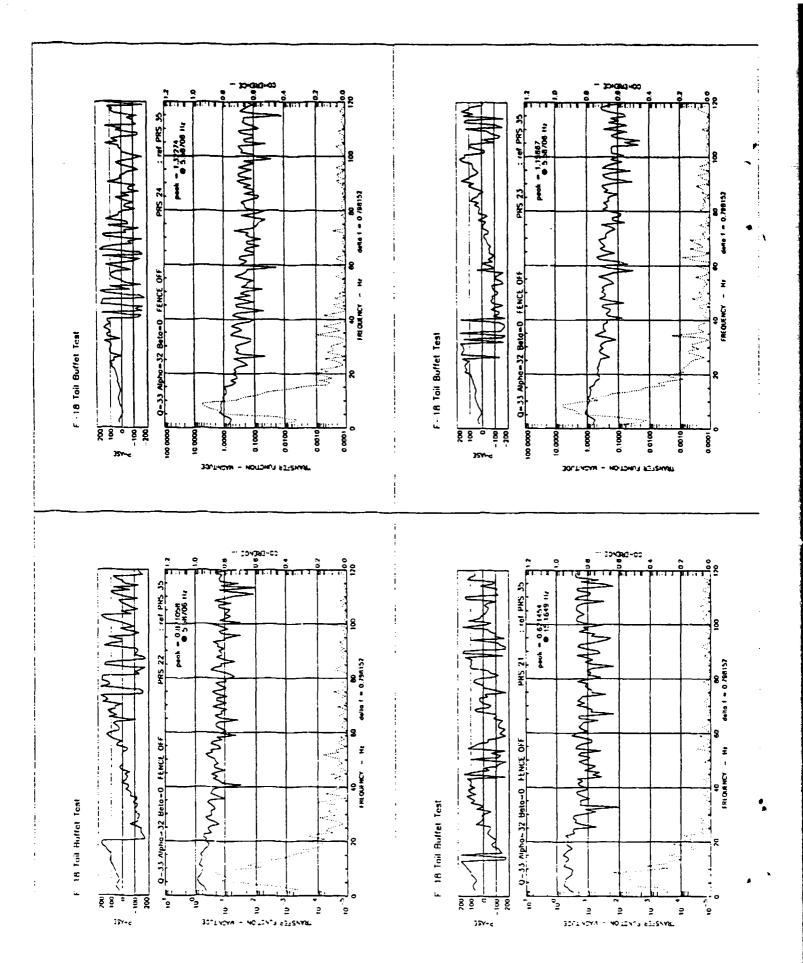


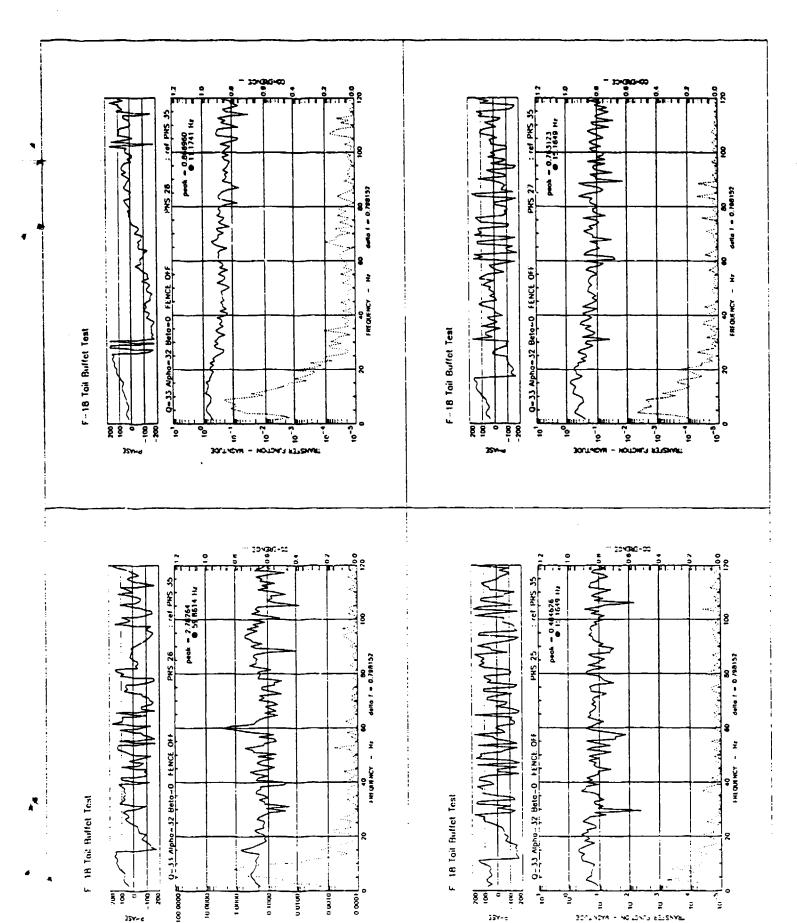




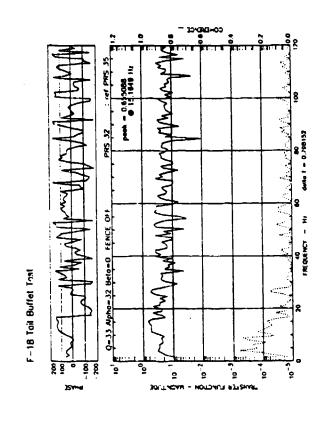


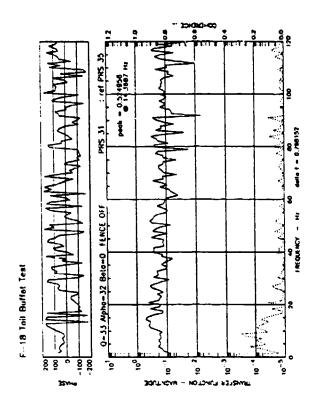


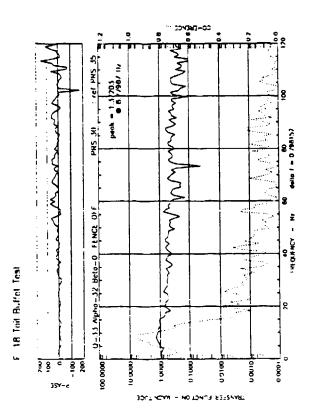


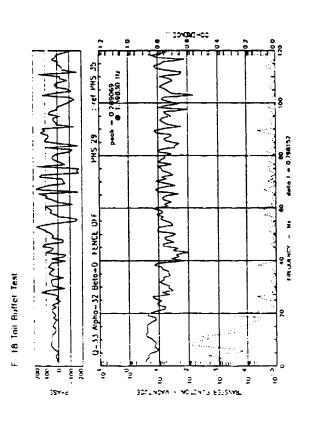


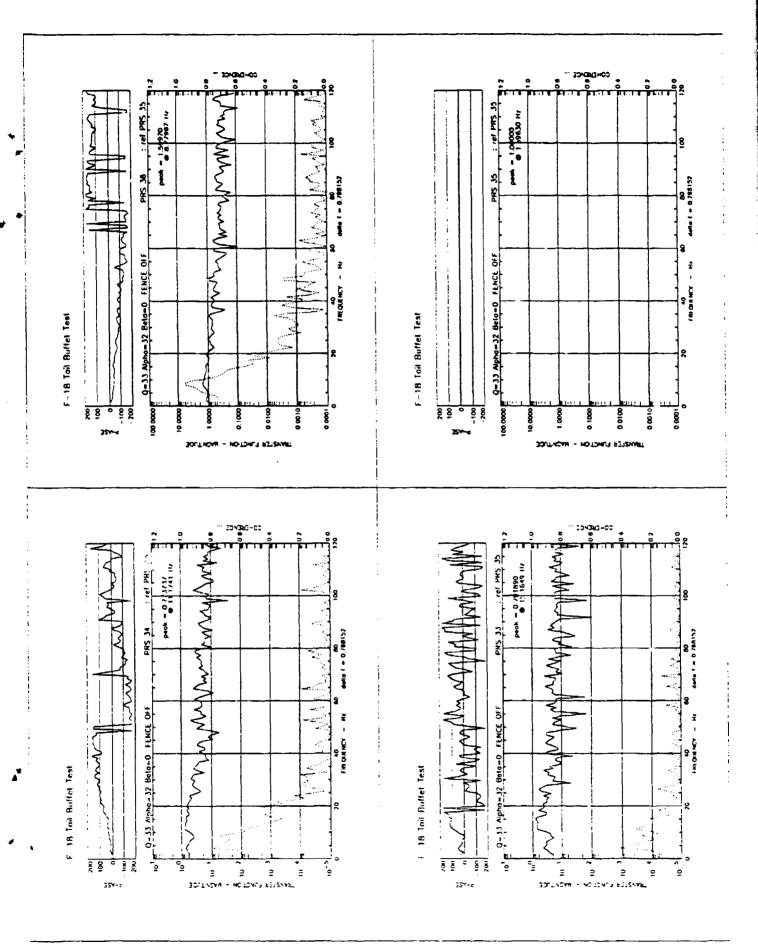
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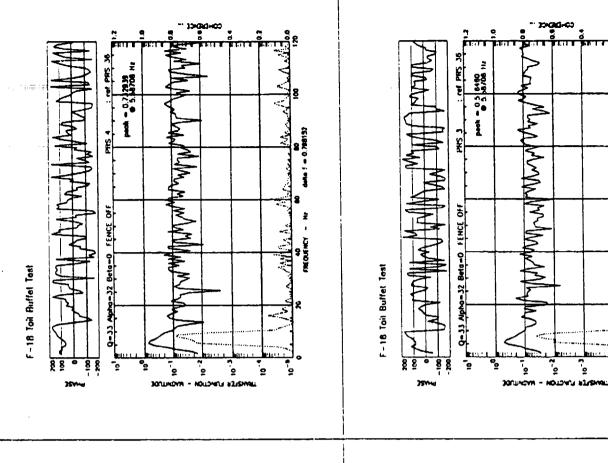












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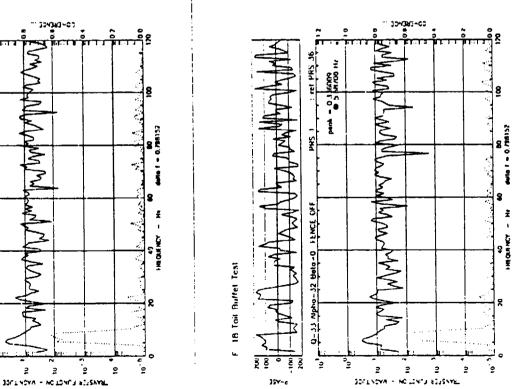
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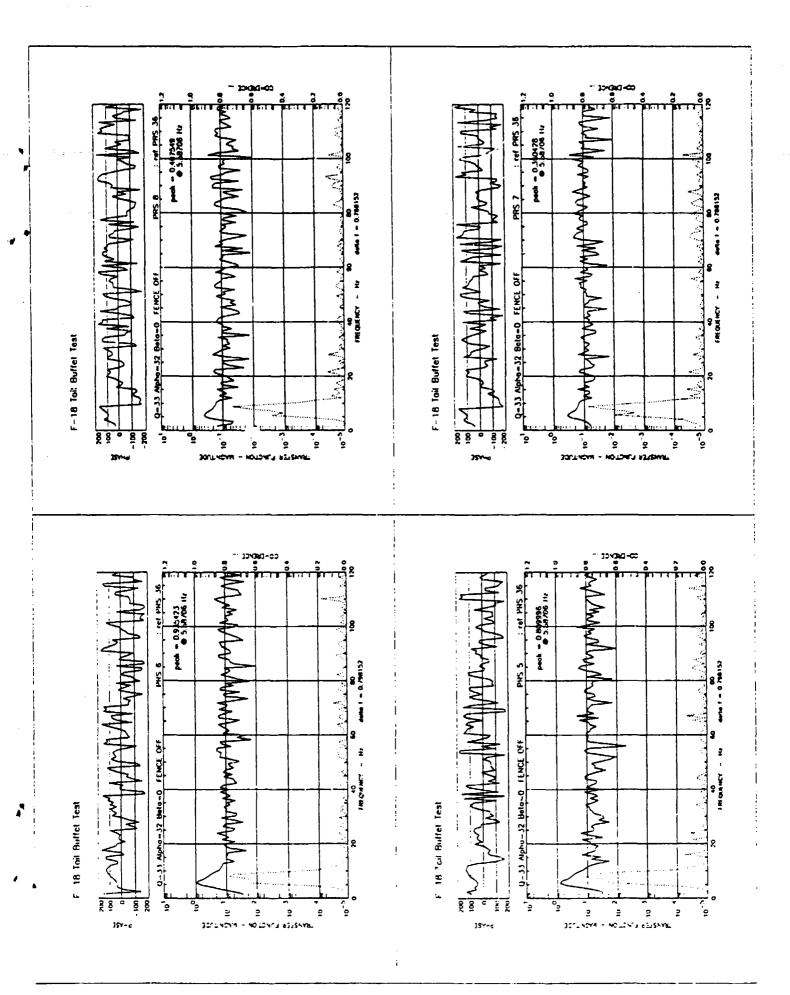
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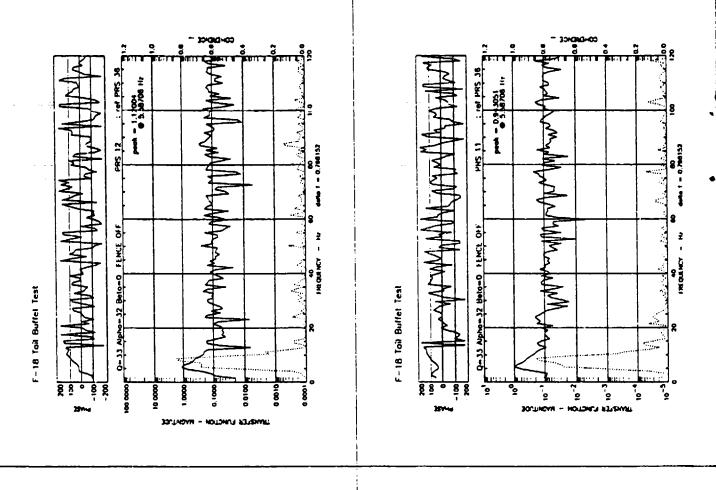
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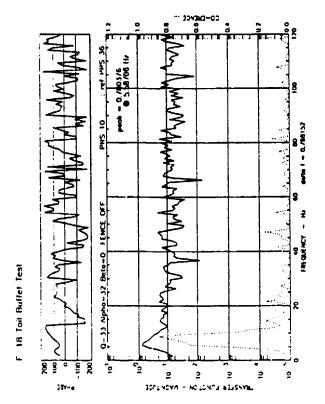
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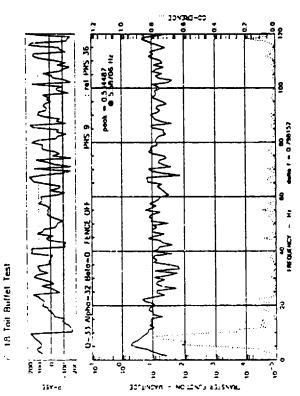
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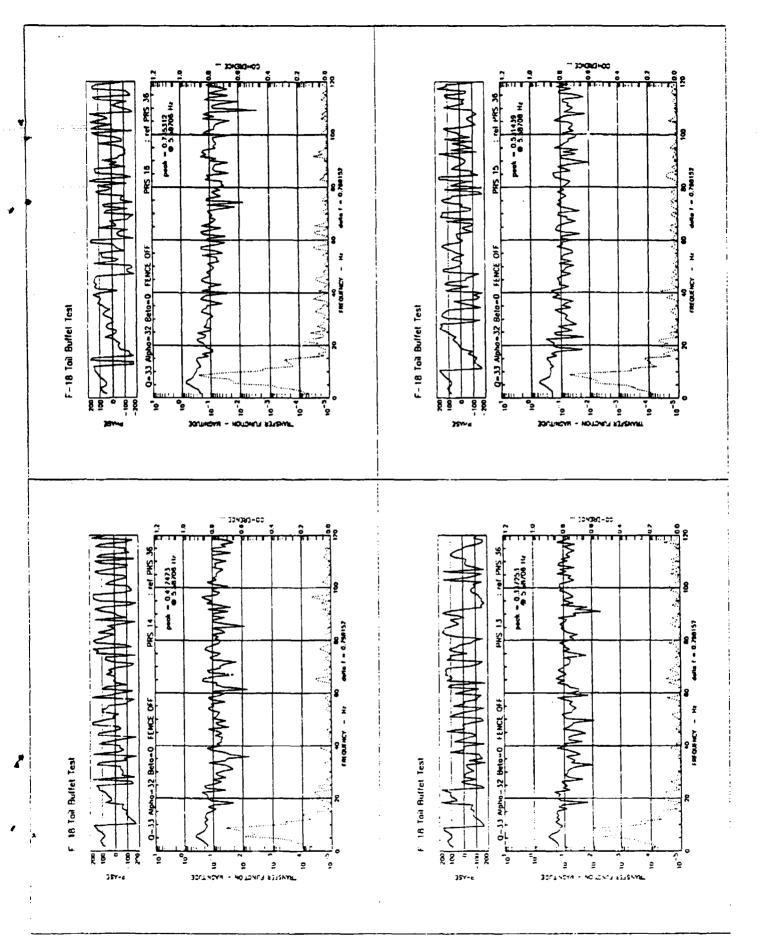


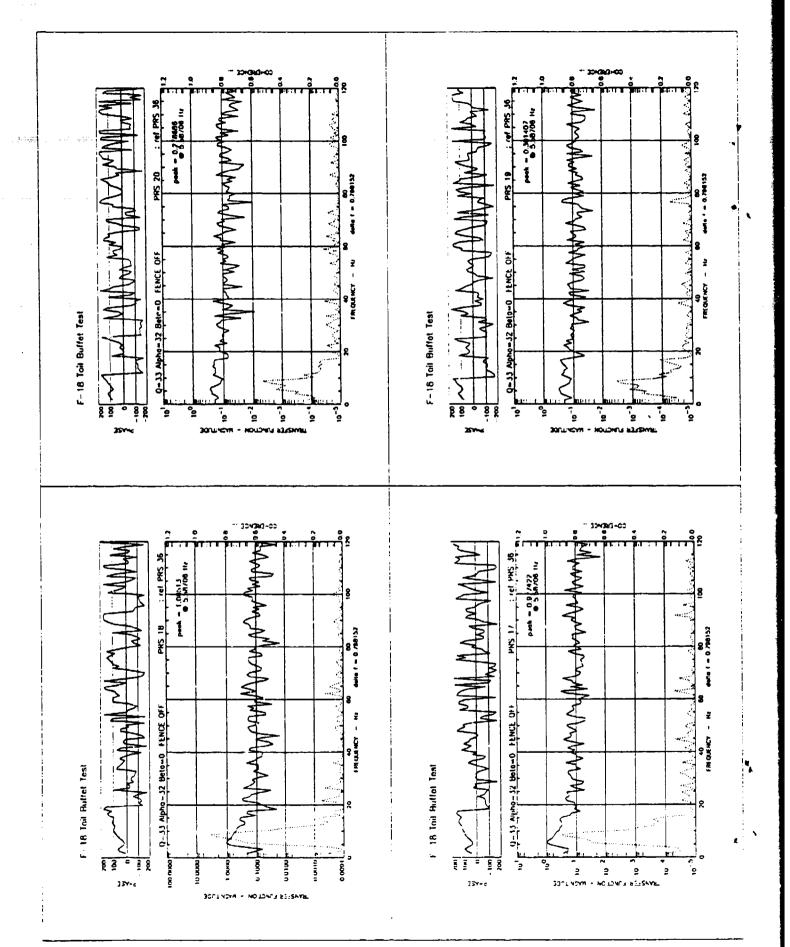


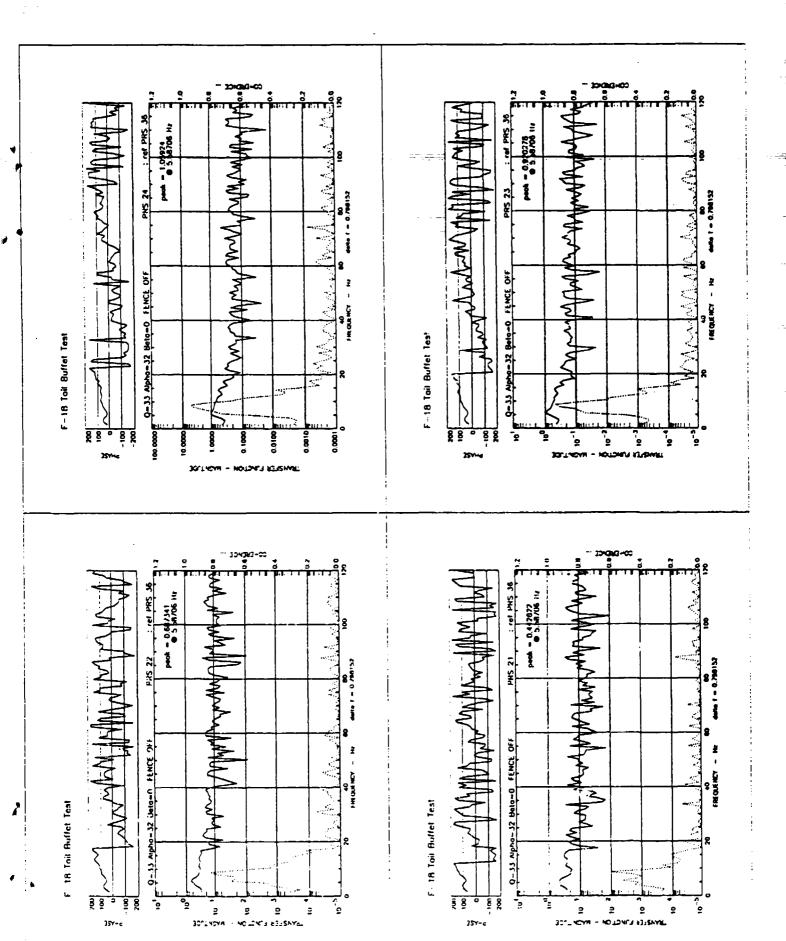


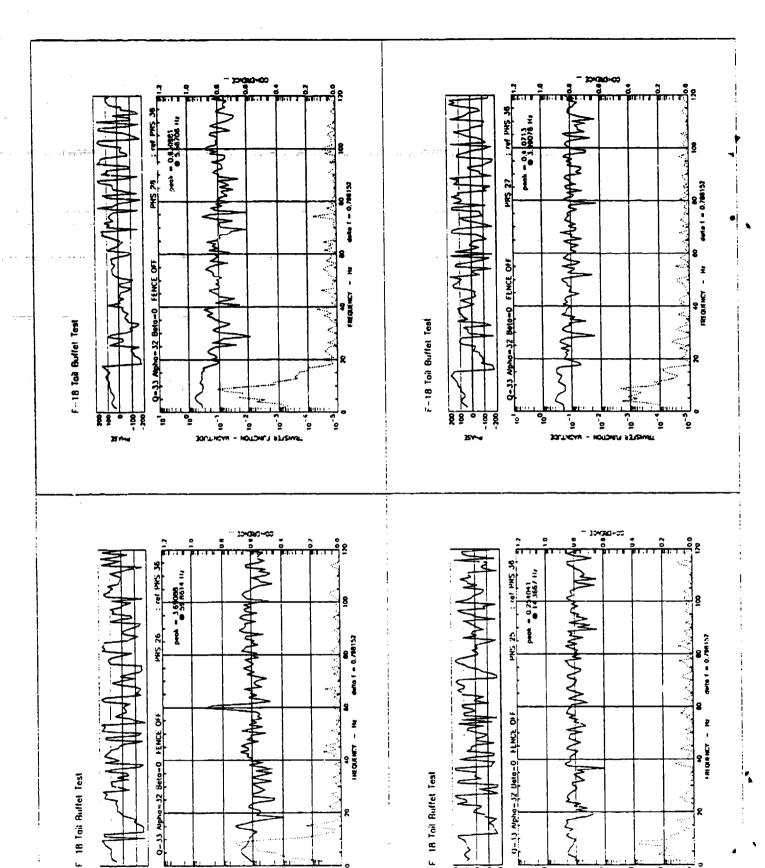












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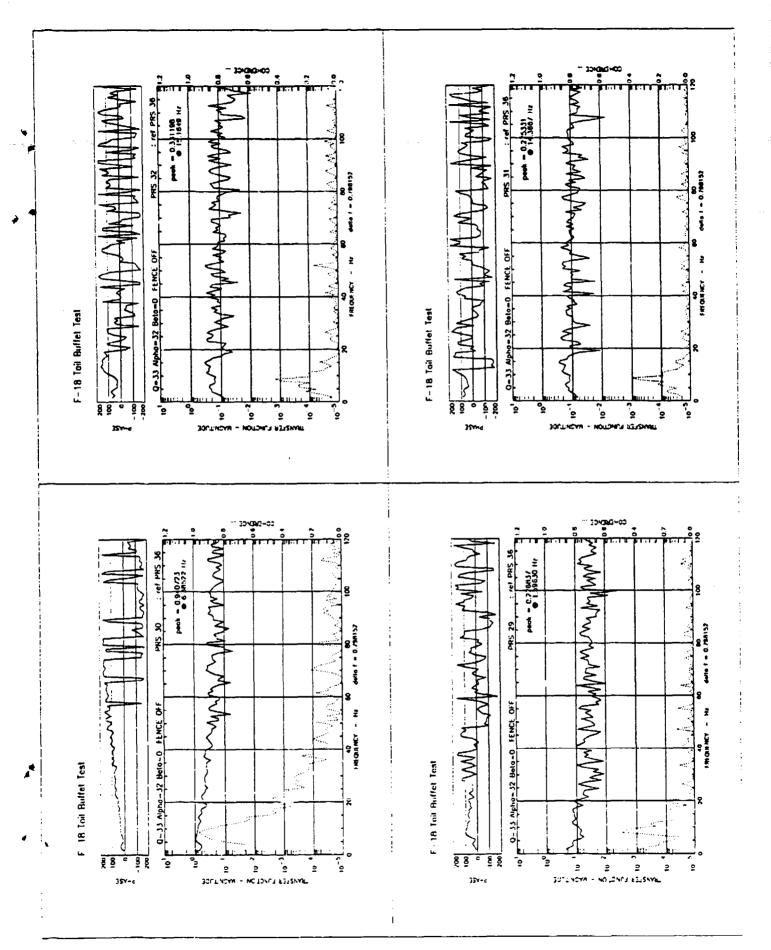
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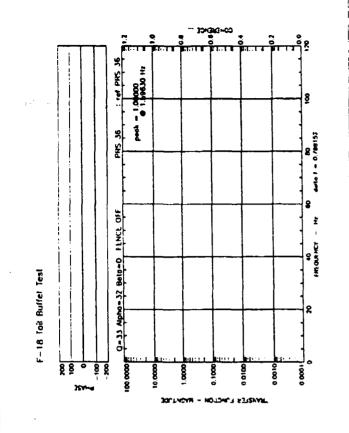
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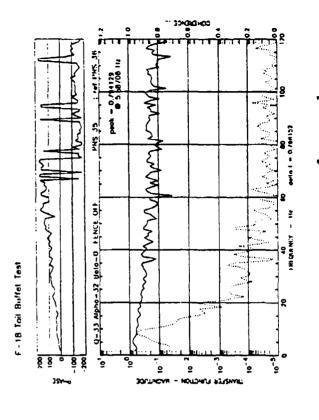
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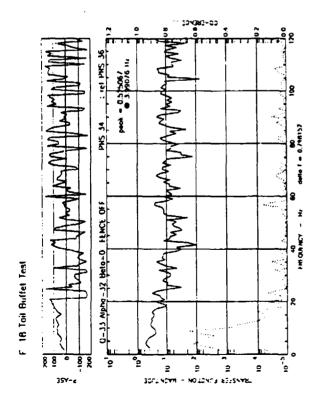
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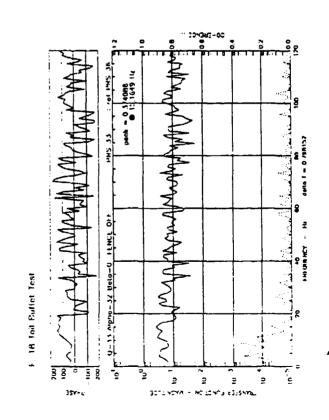
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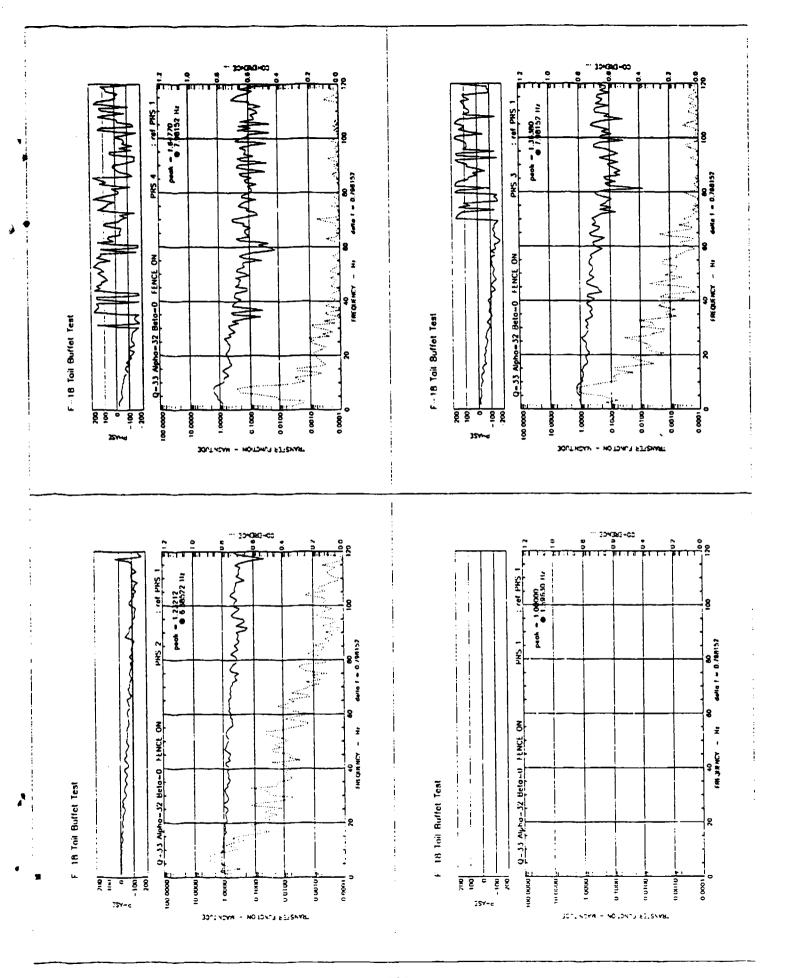


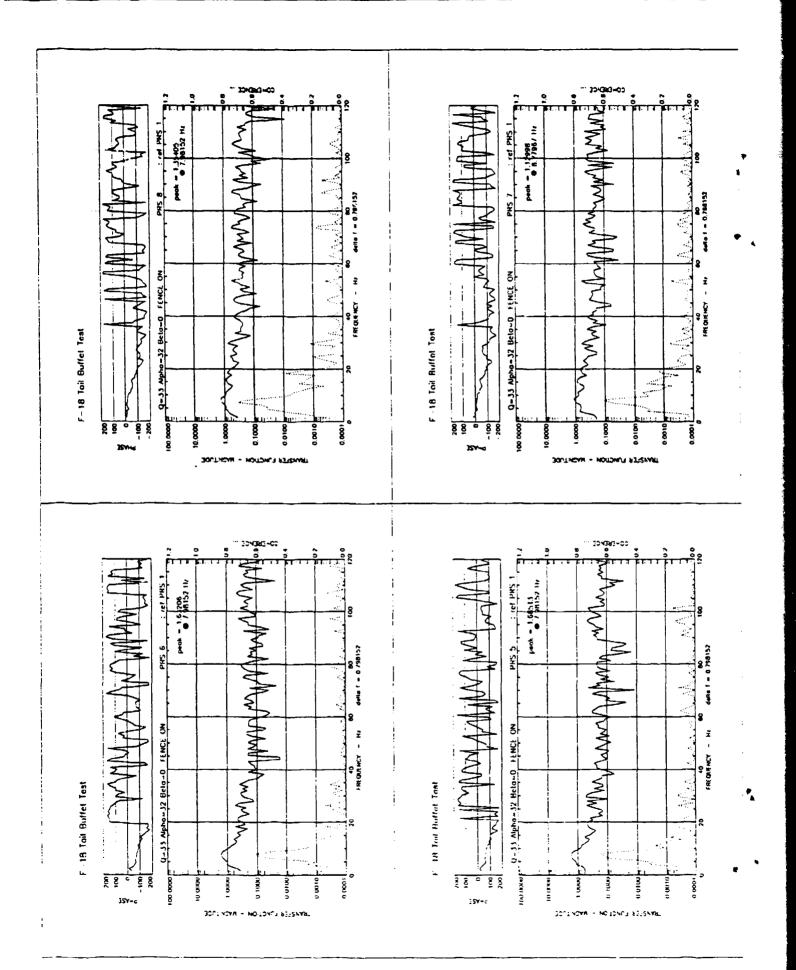


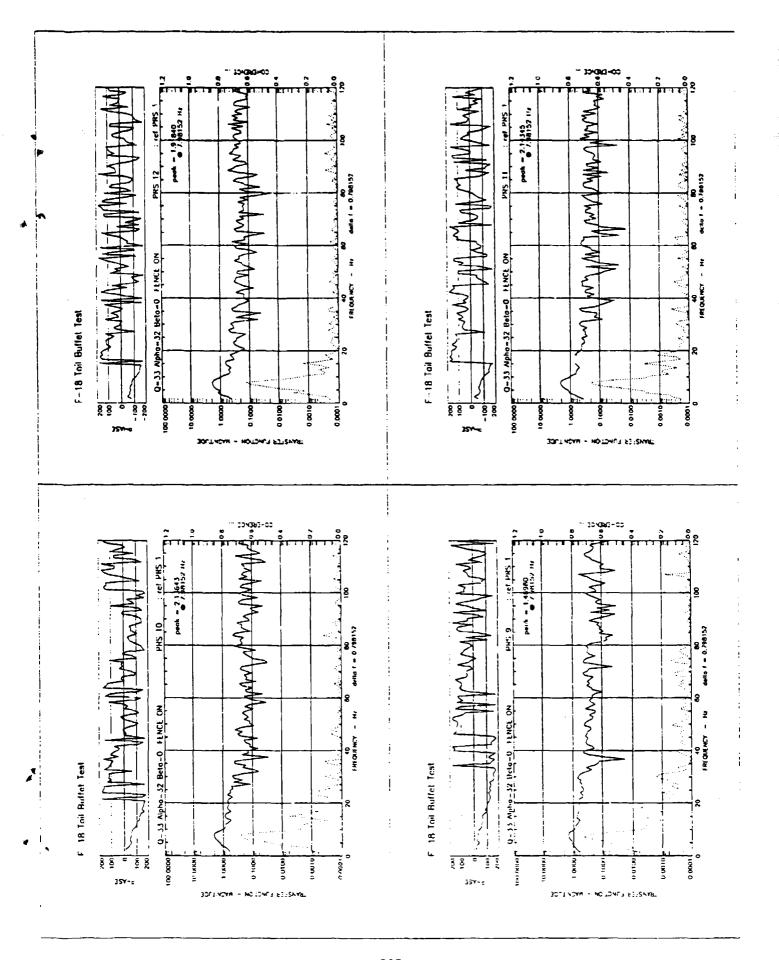
Differential Pressure Coefficient Cross Spectral Densities

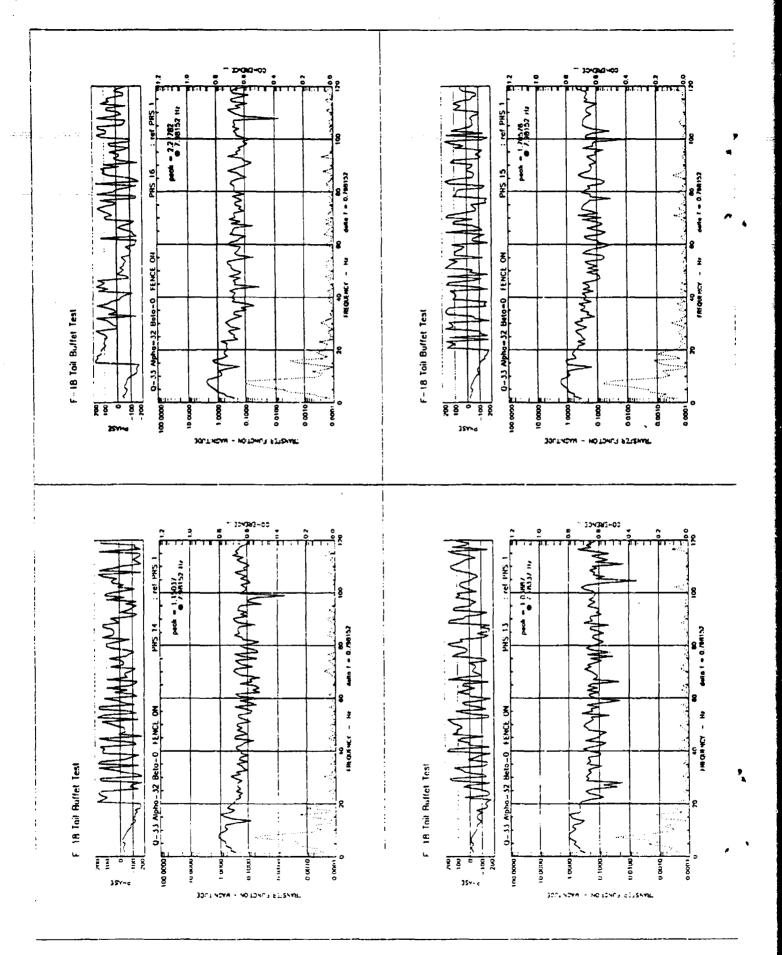
$$\alpha = 32^{\circ}$$
, $\beta = 0^{\circ}$, $Q = 33 psf$
(LEX fence ON)

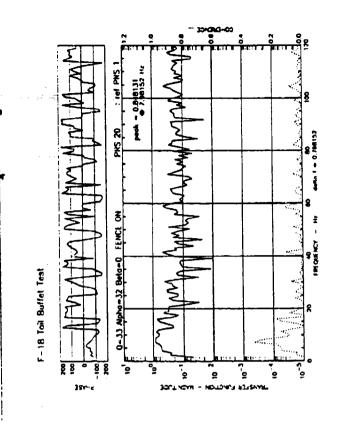
Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers being analyzed are listed near the upper right of each chart. Refer to the transducer reference numbers displayed in Figure 1.

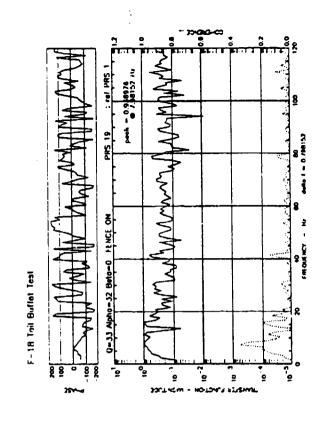


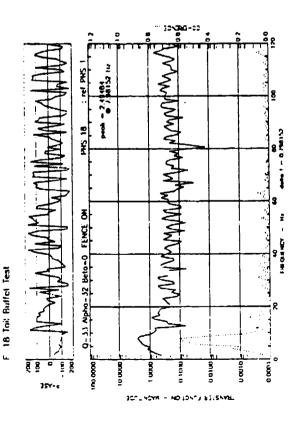


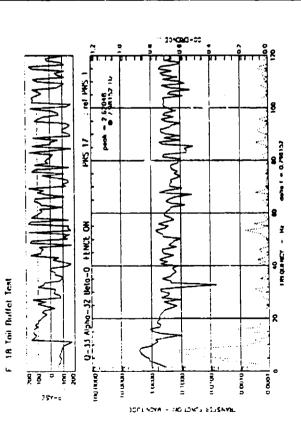


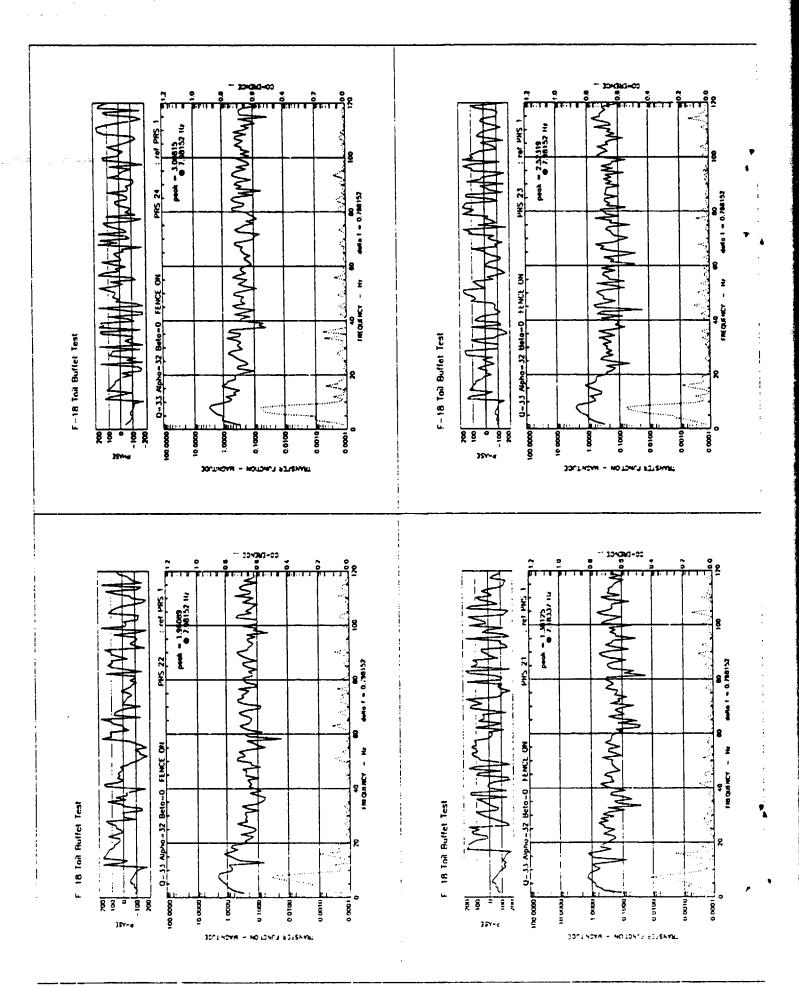


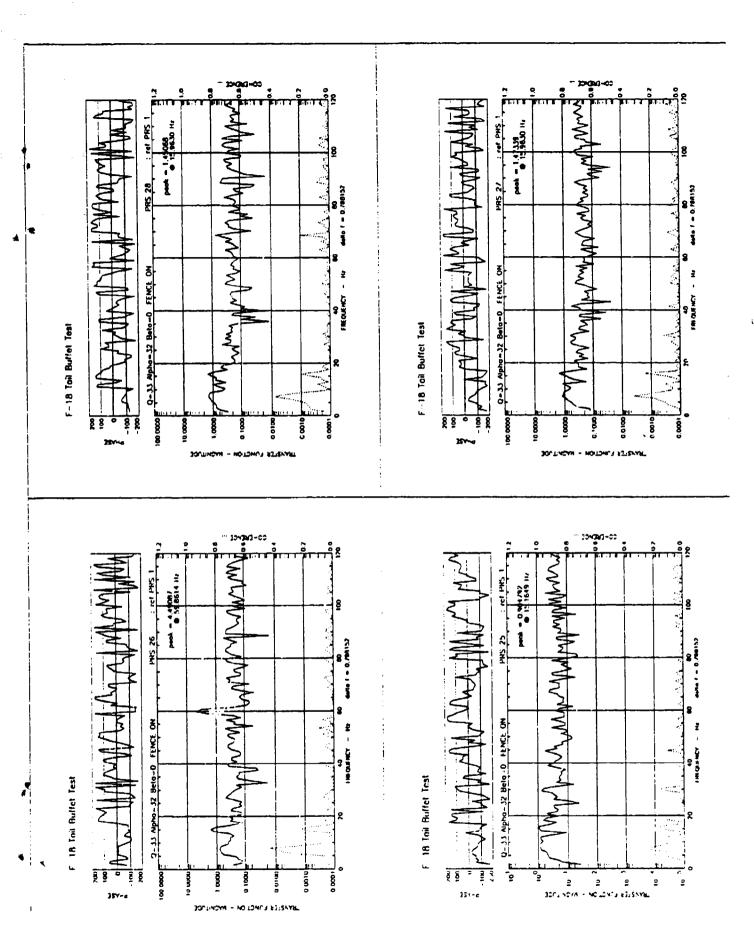


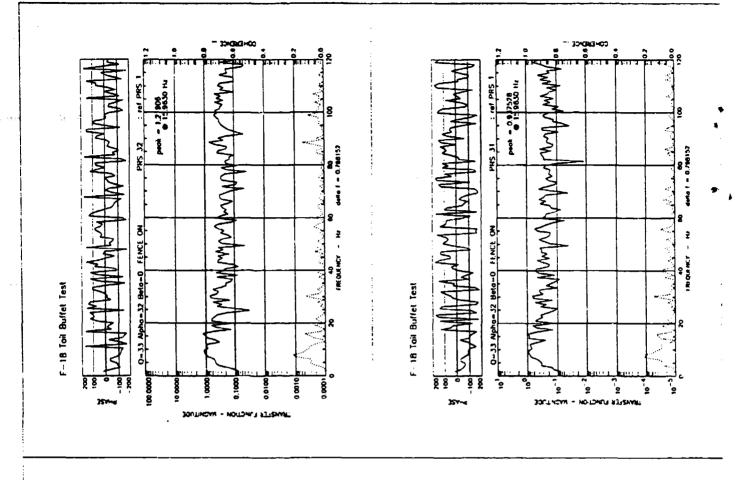


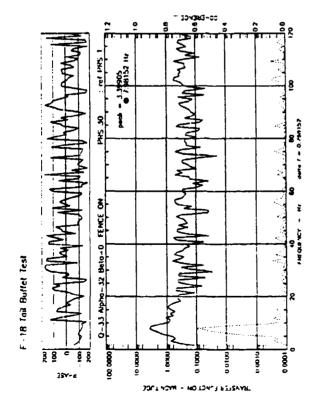


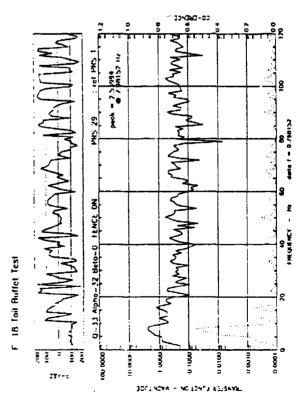


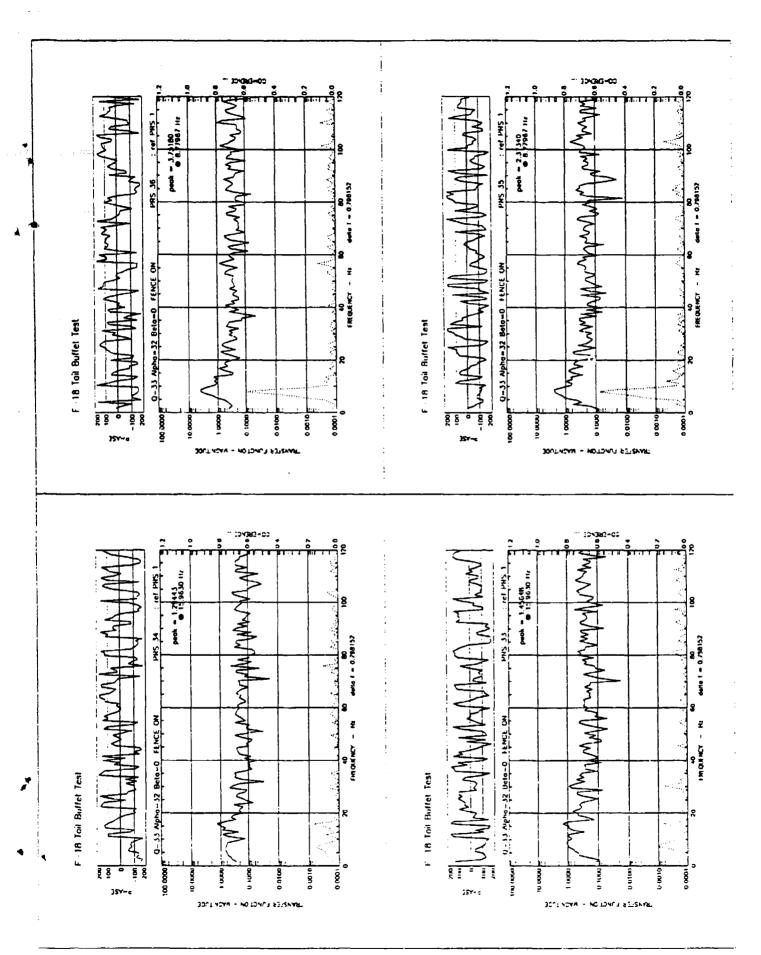


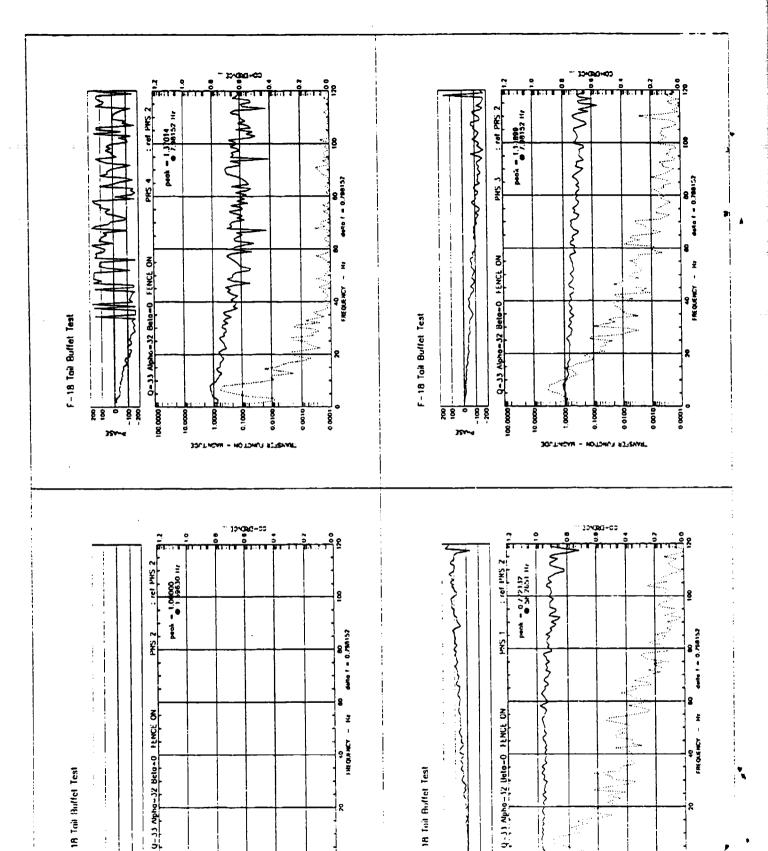












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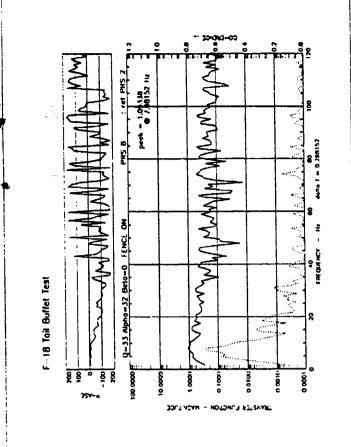
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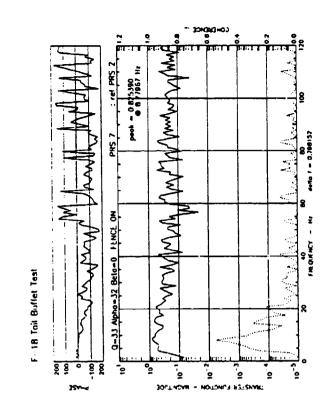
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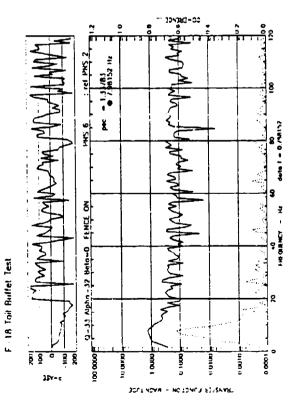
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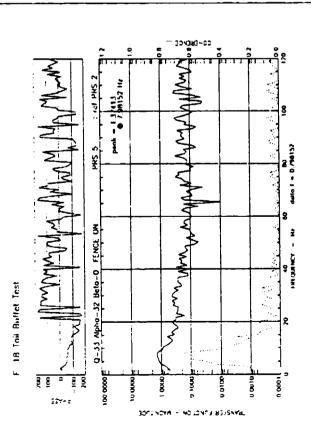
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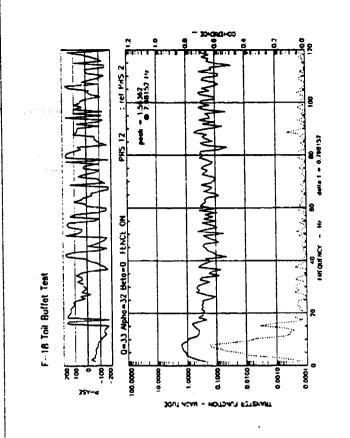
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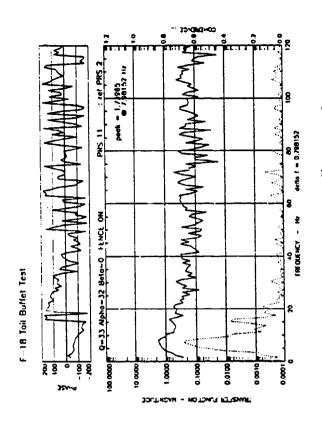


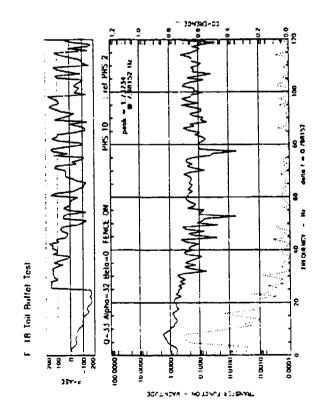


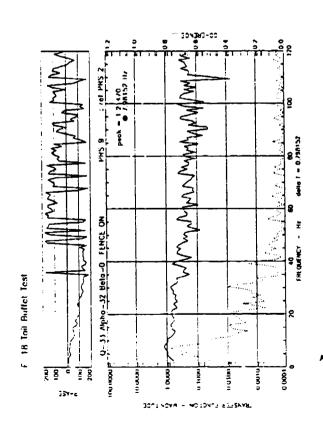


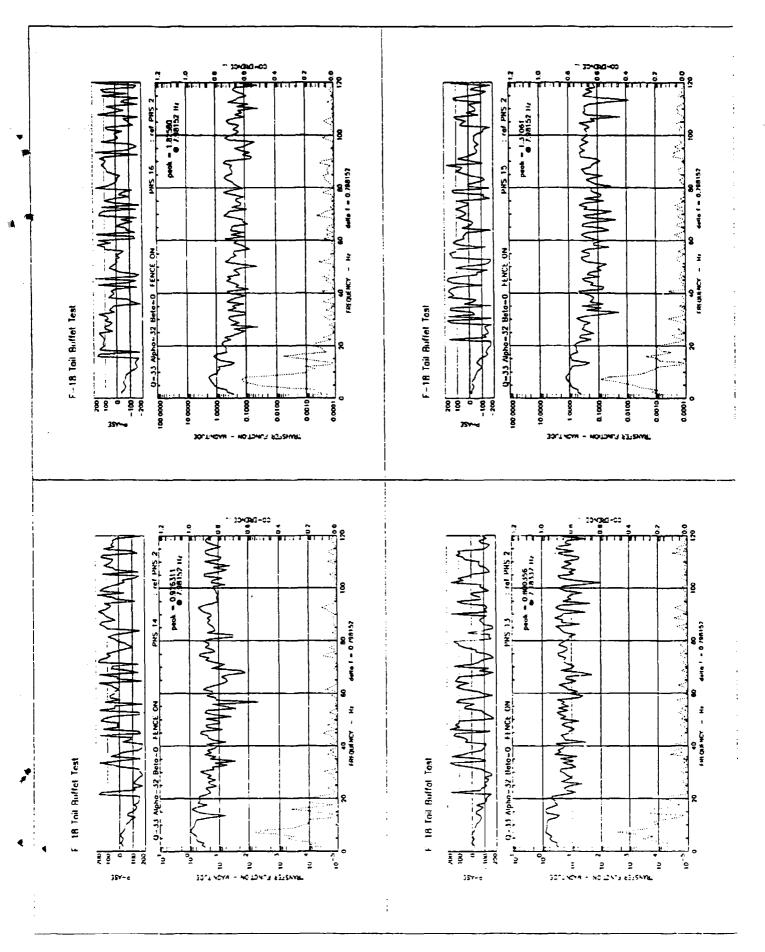


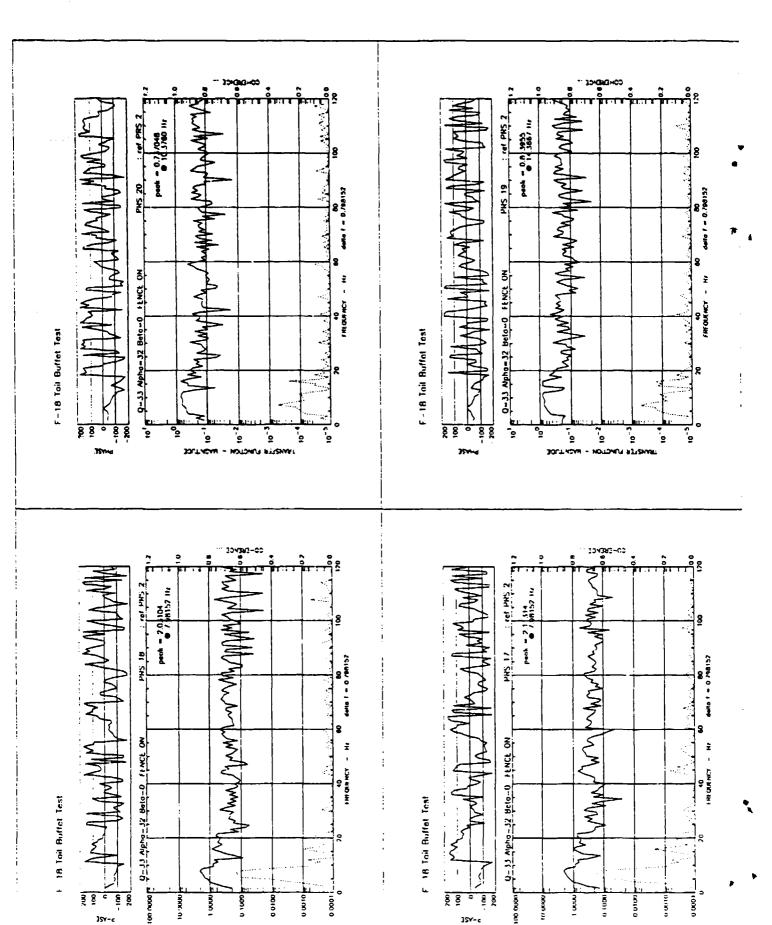






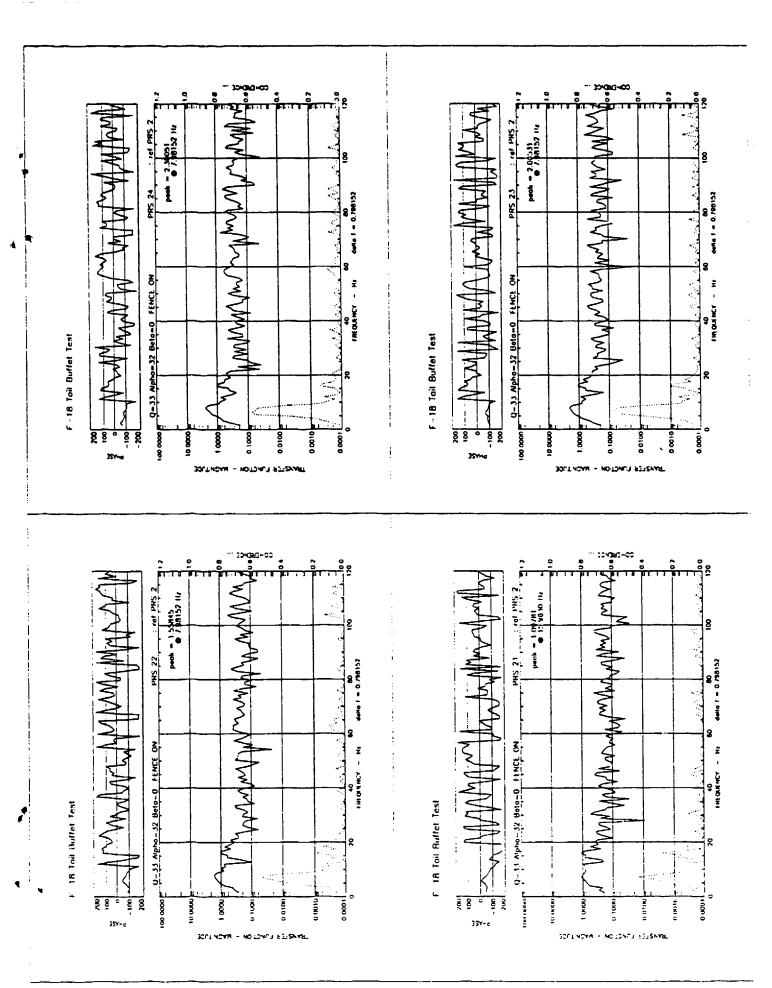


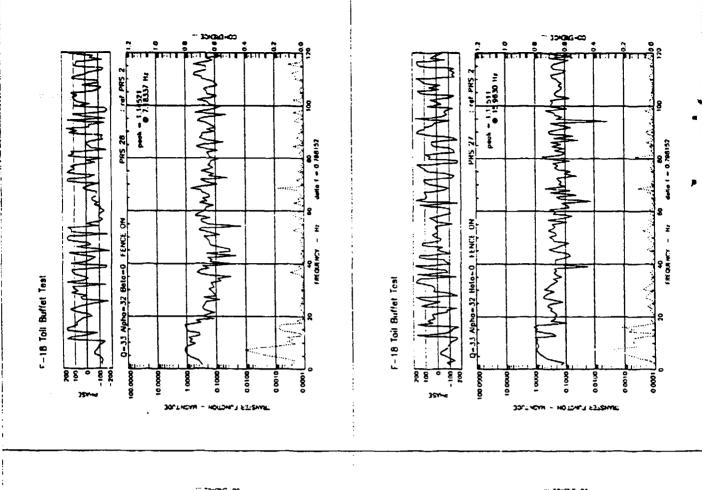


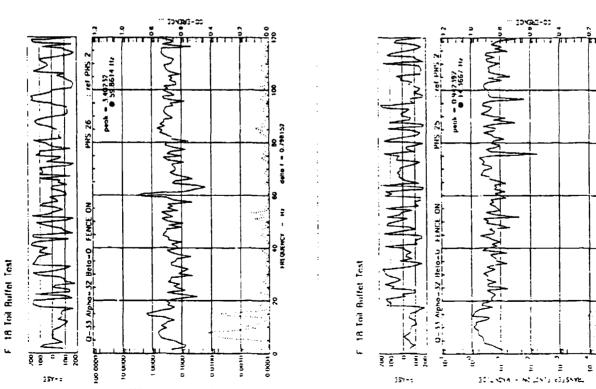


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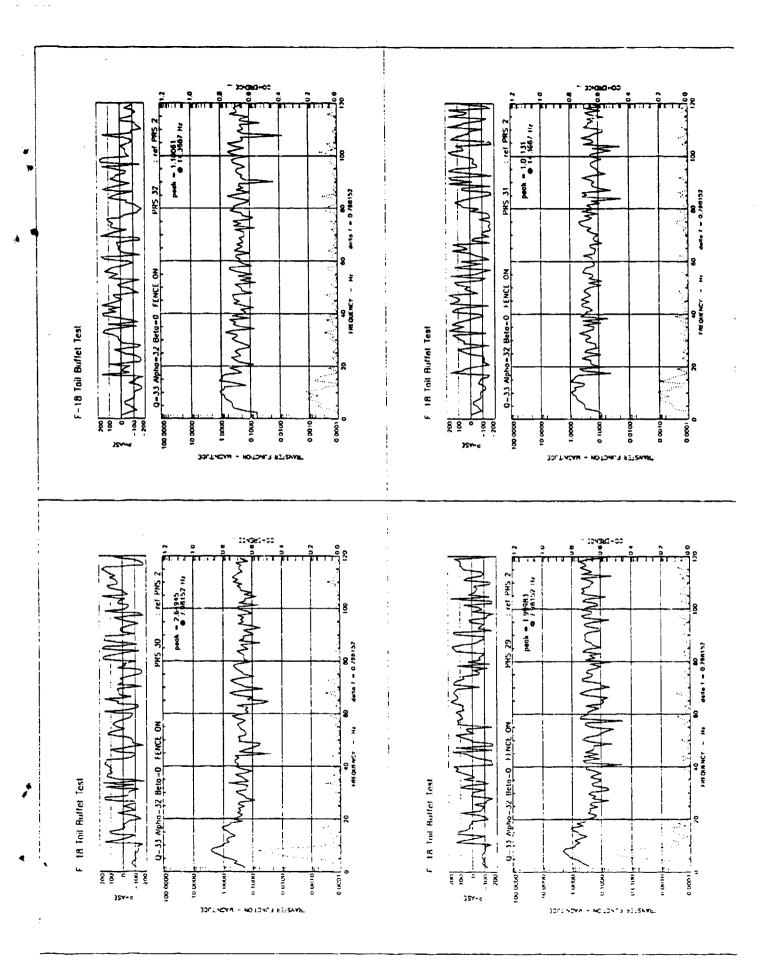
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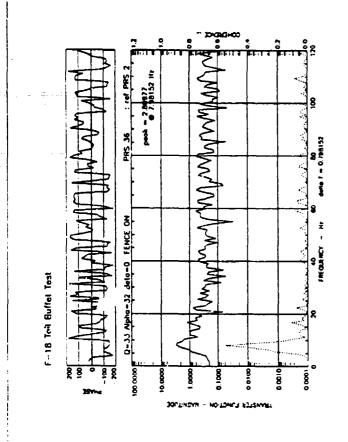


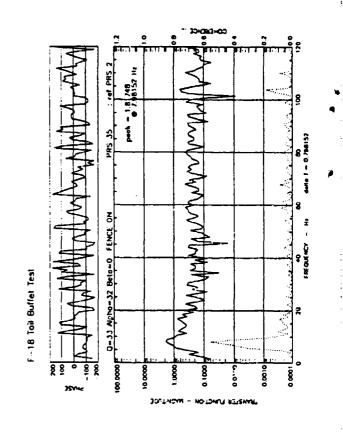


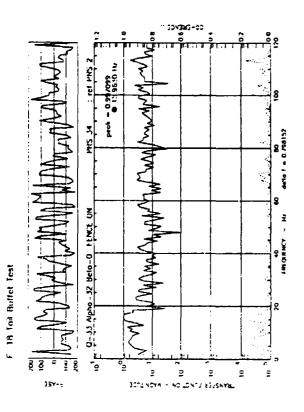


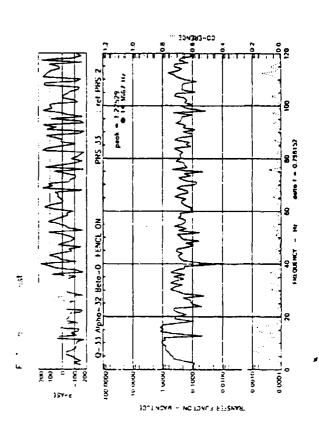
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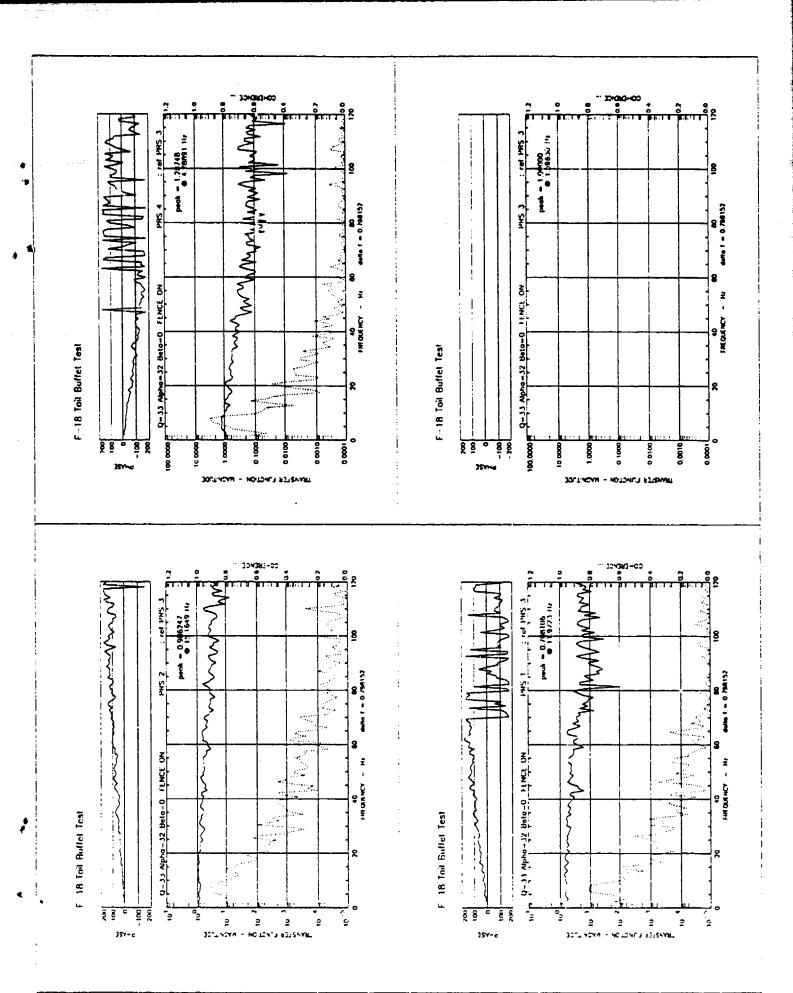


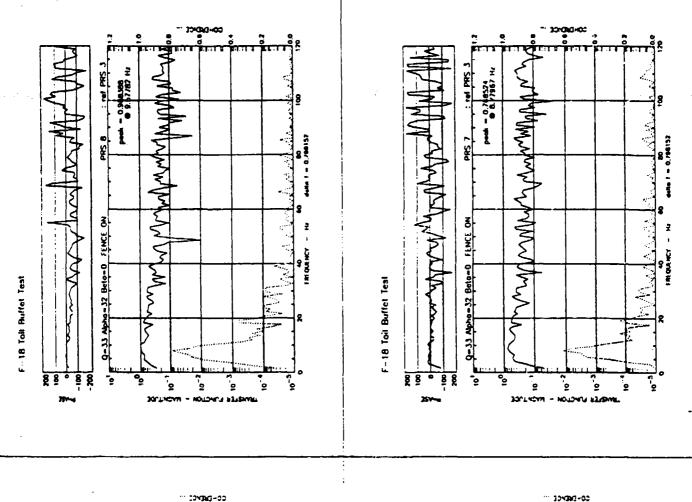


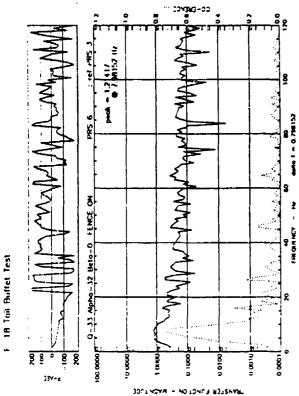


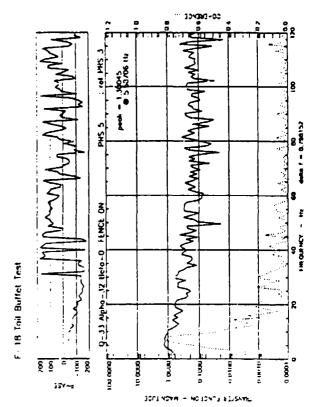


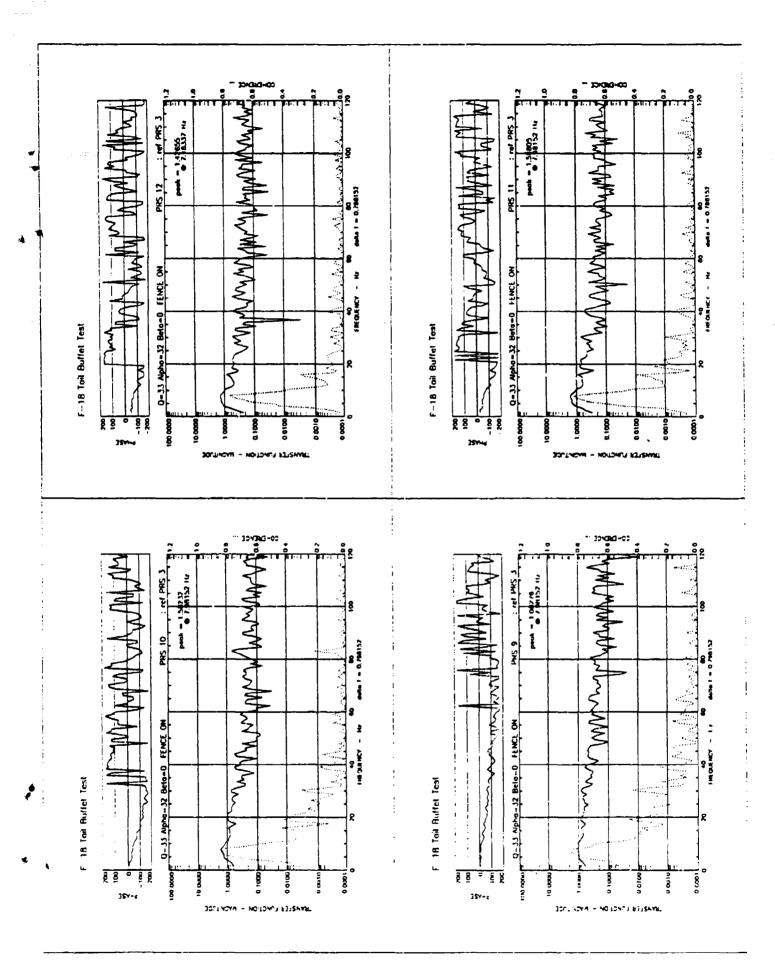


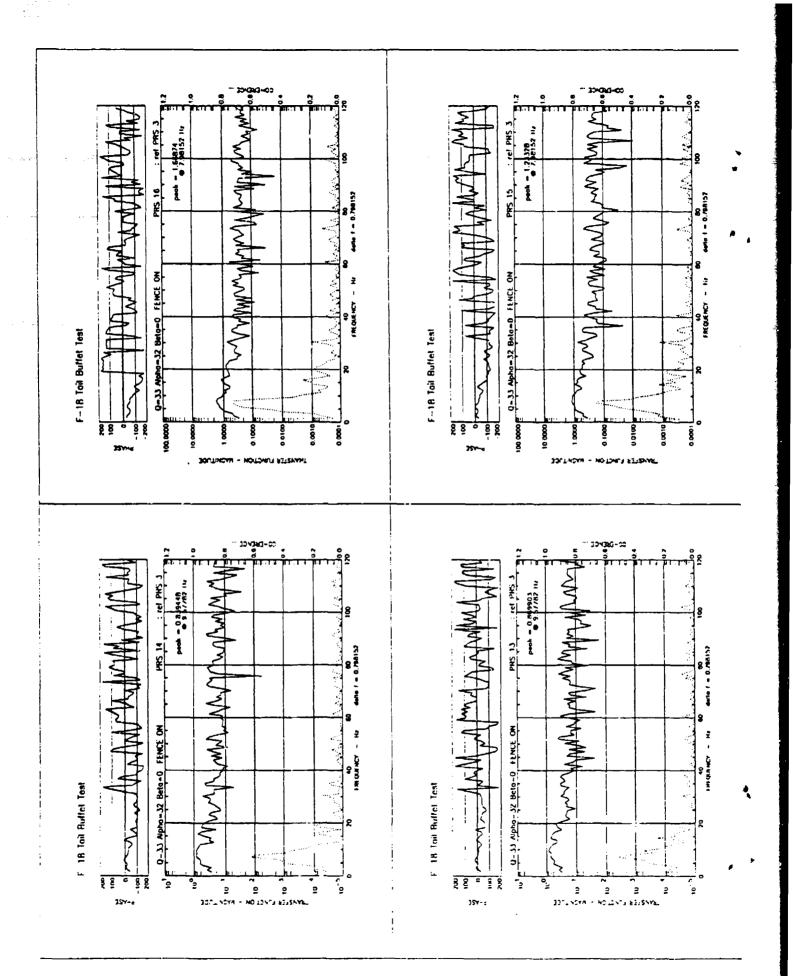


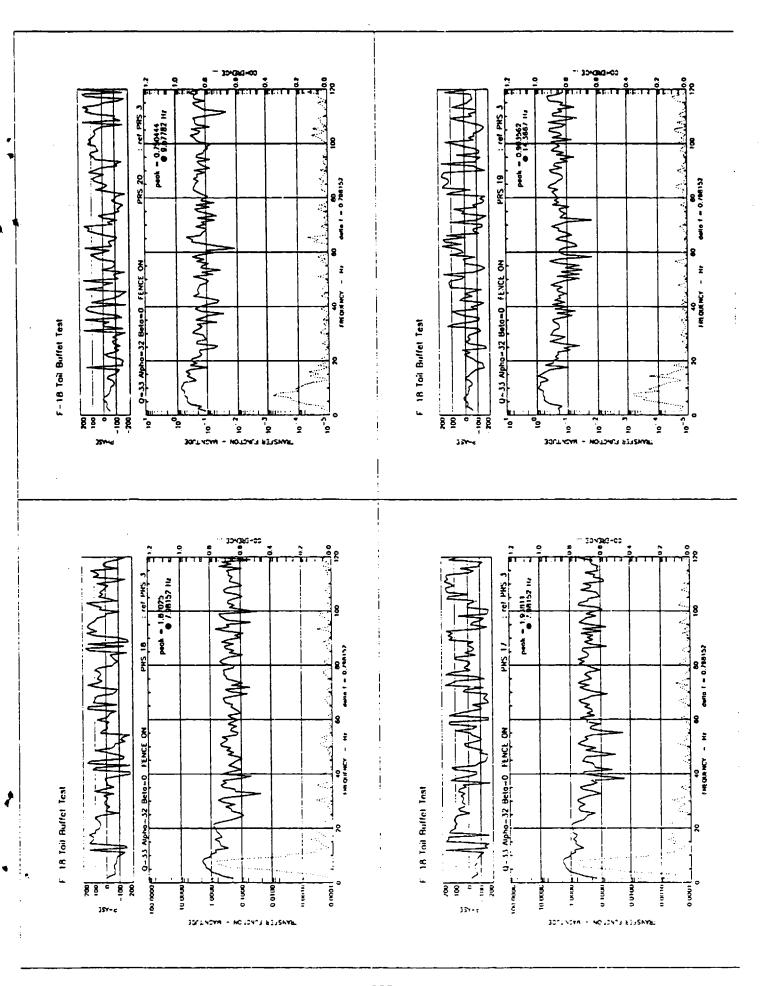


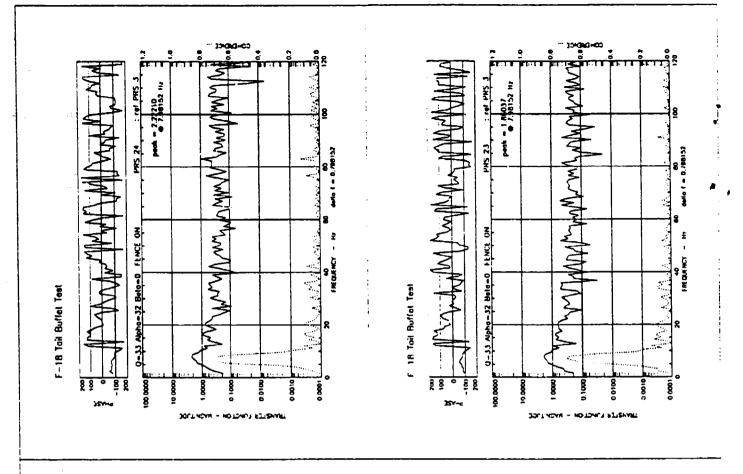


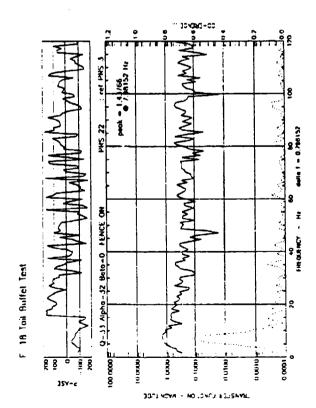


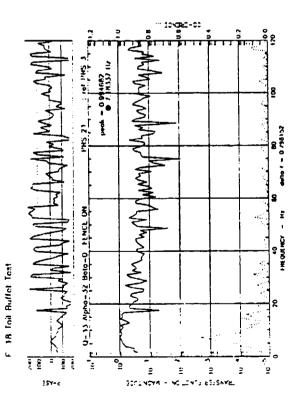


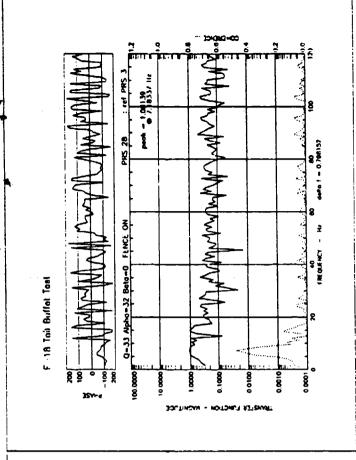


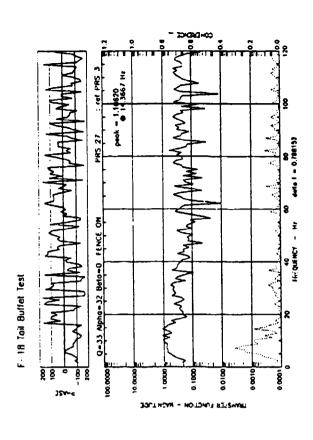


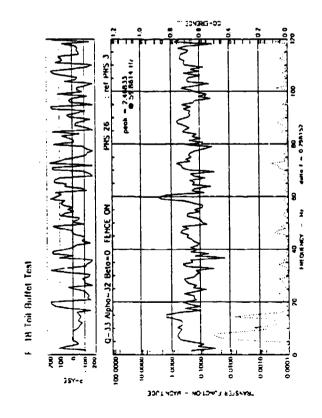


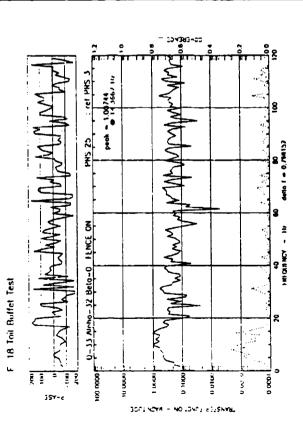


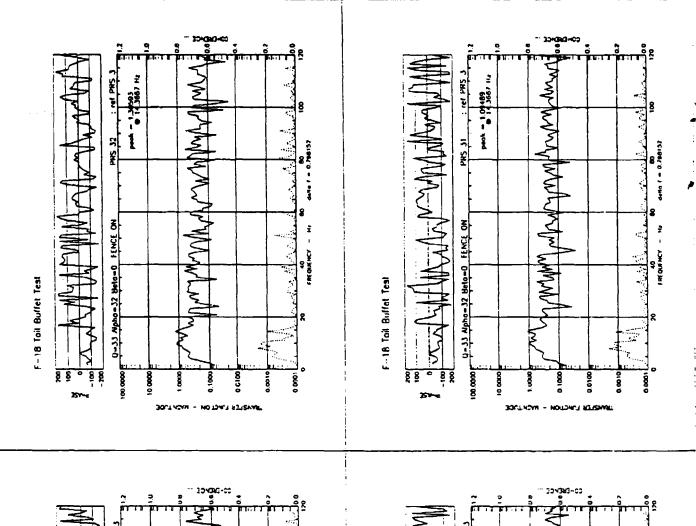


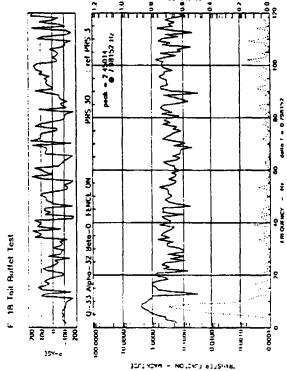


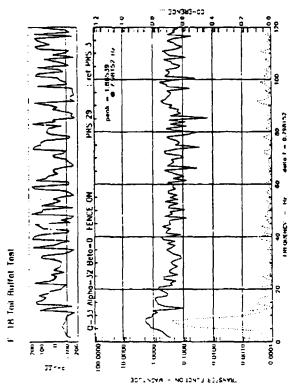


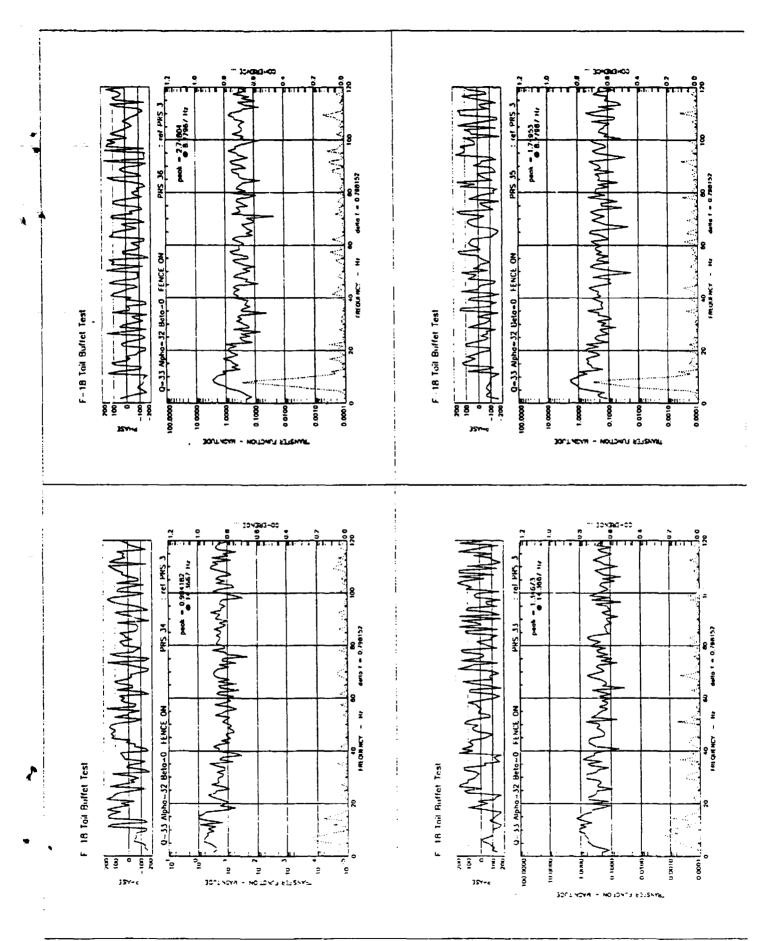


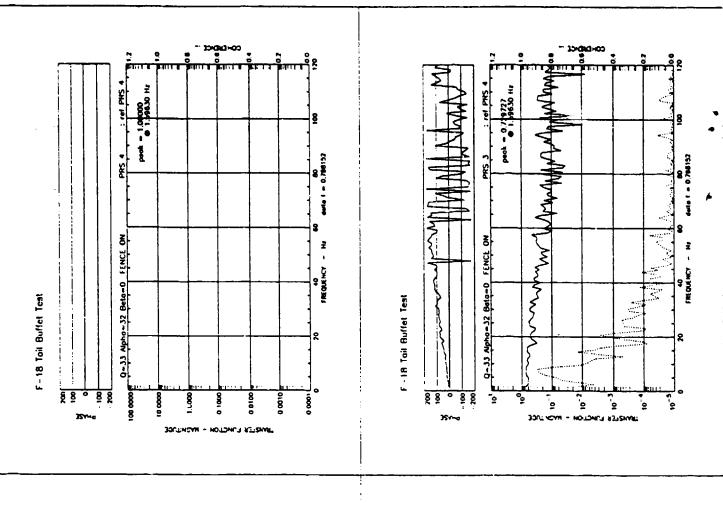


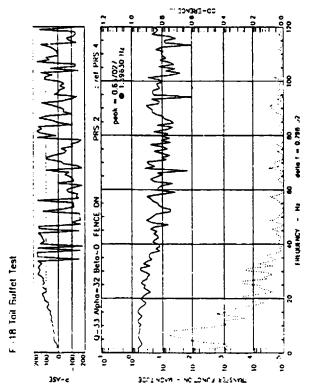


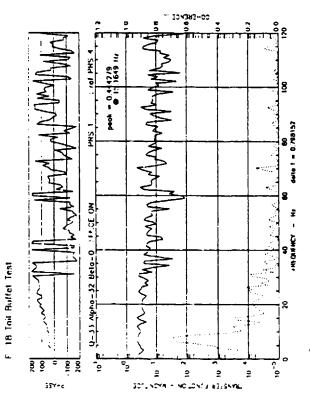


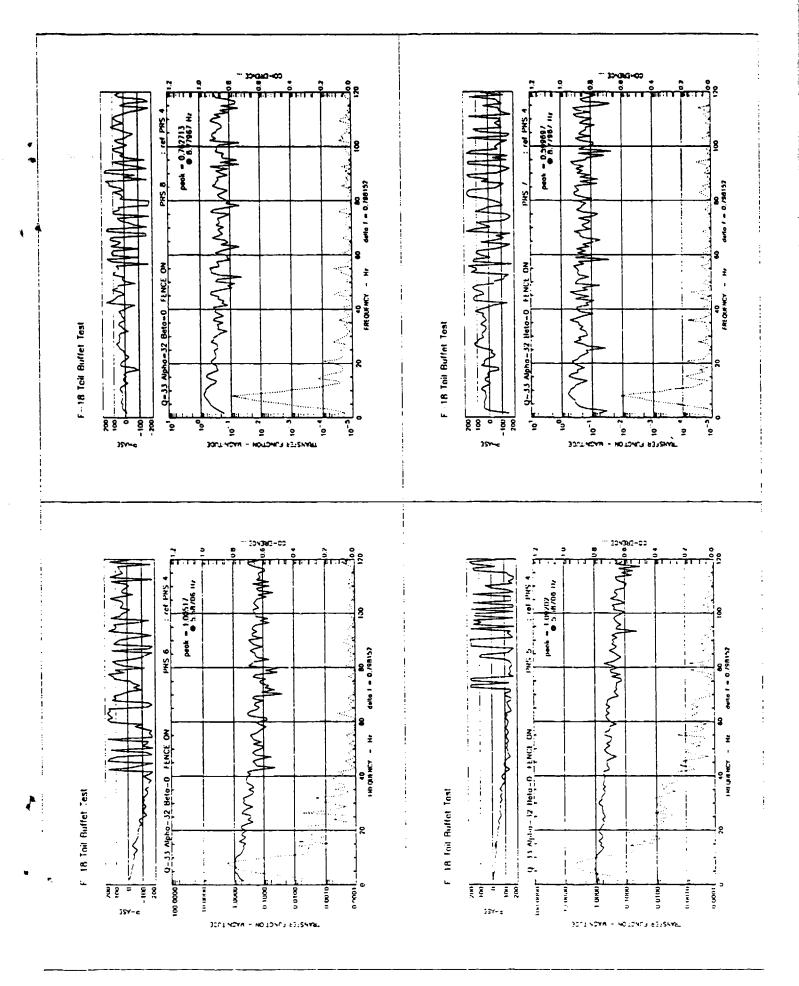


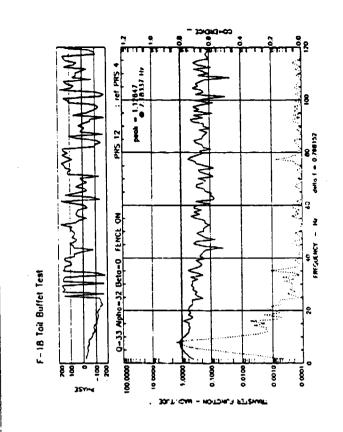


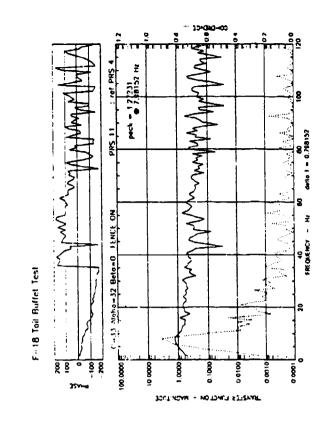


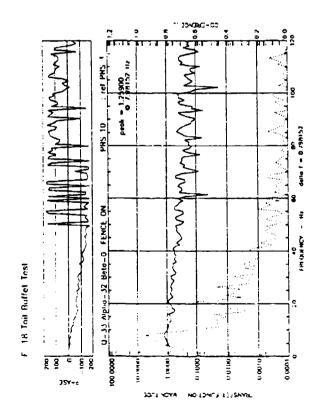


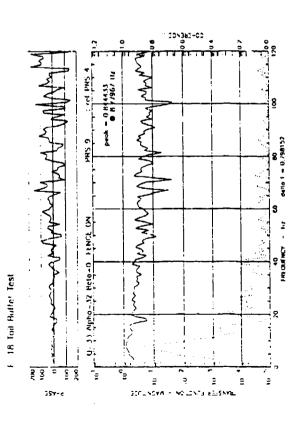


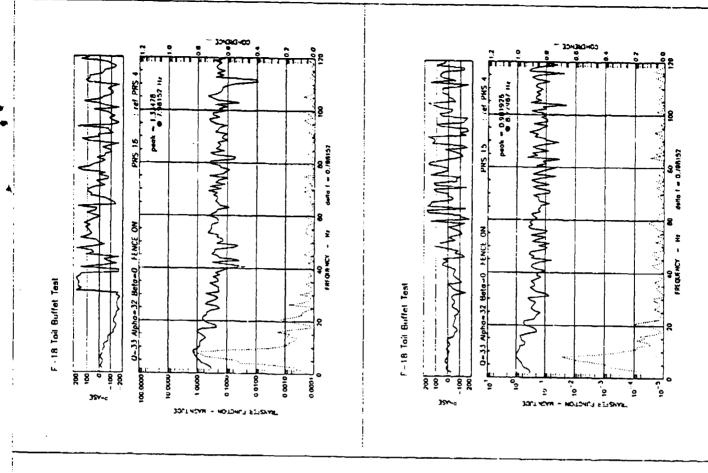


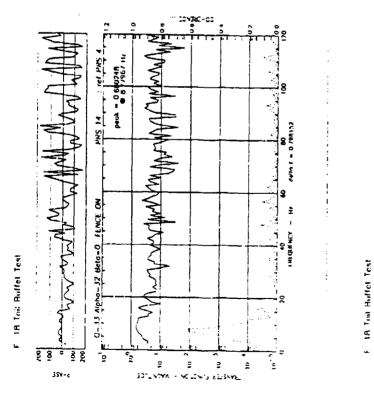


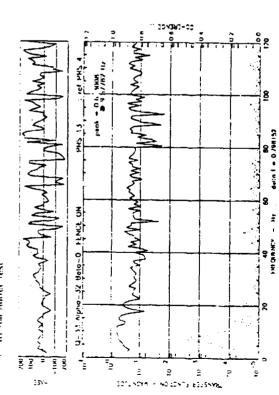


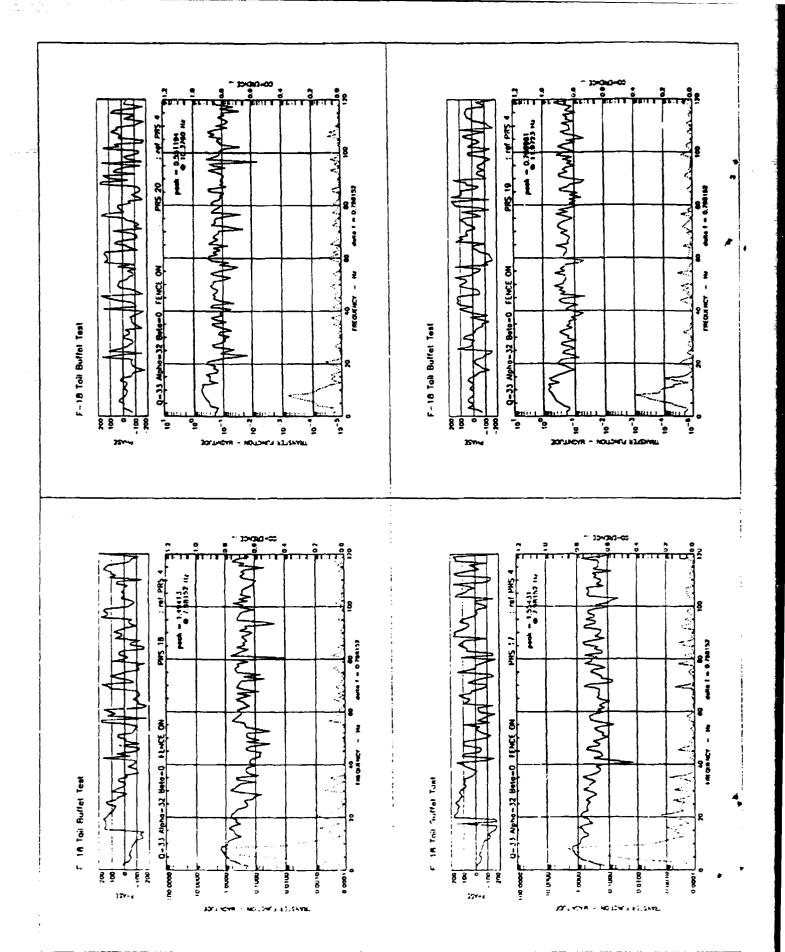


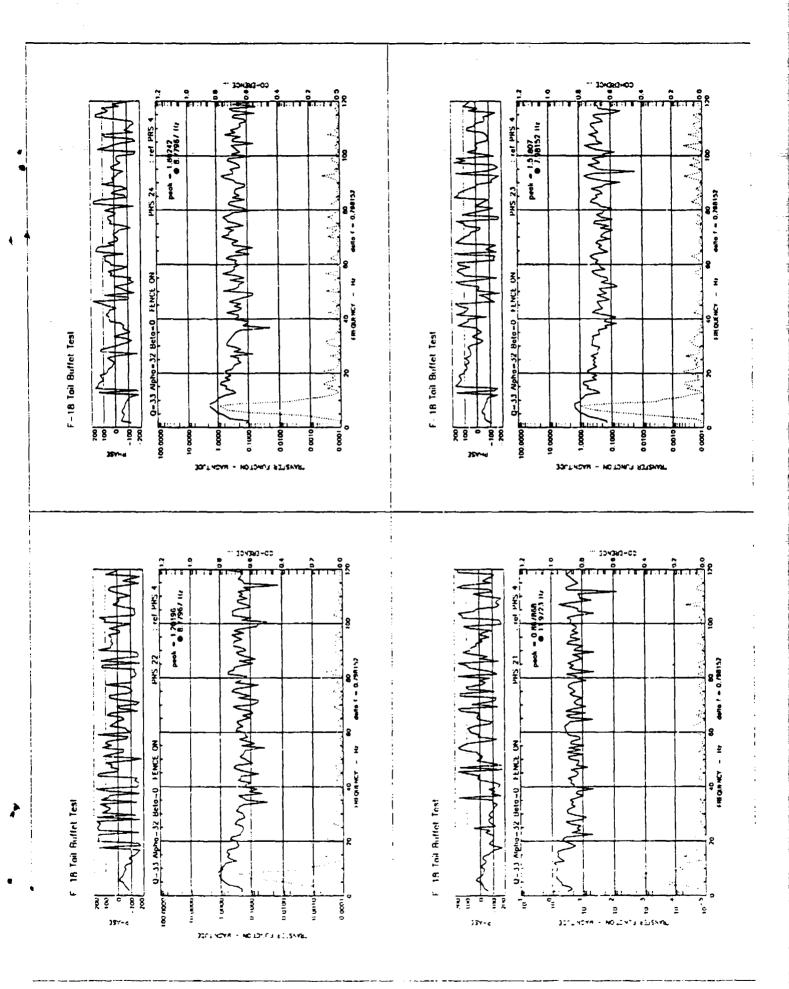


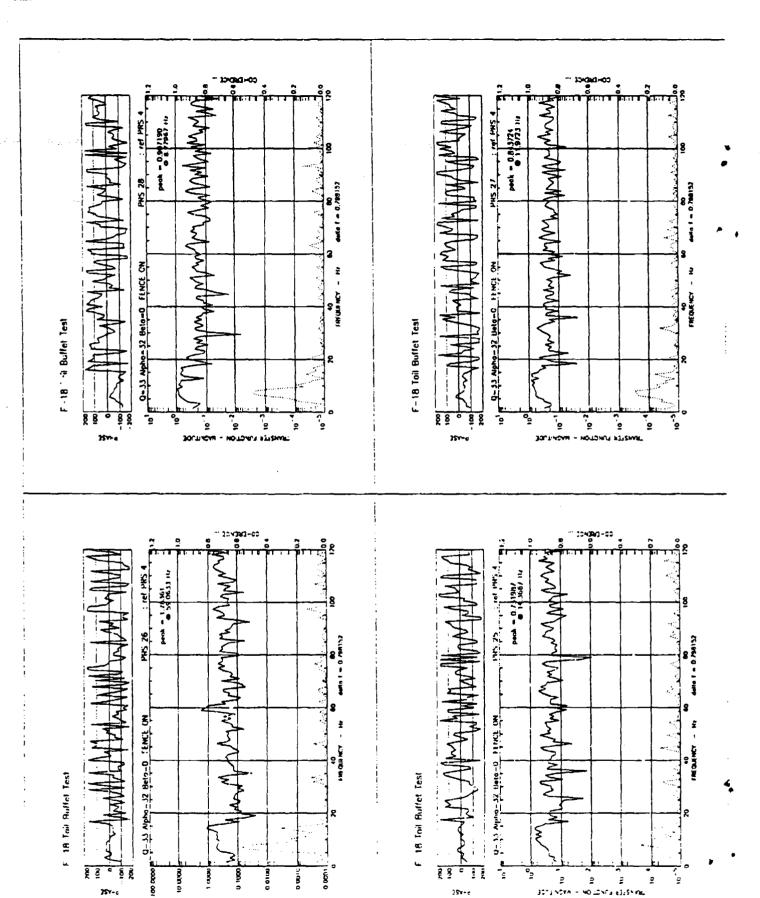












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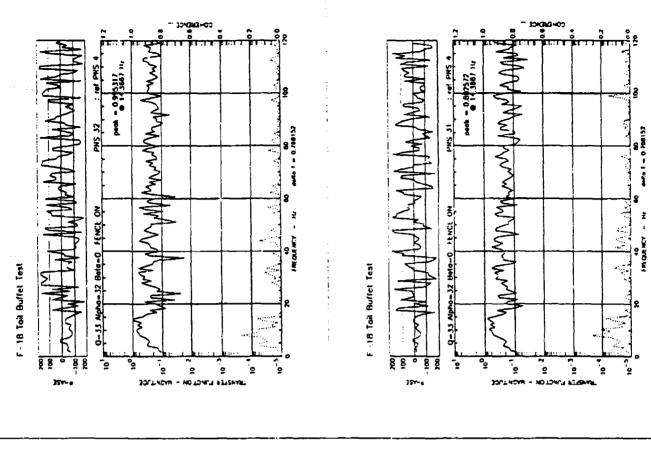
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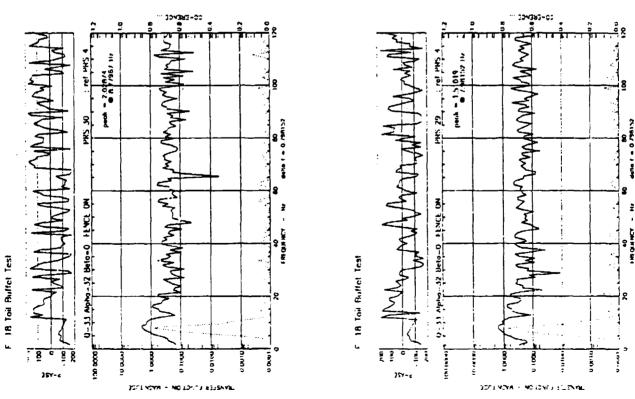
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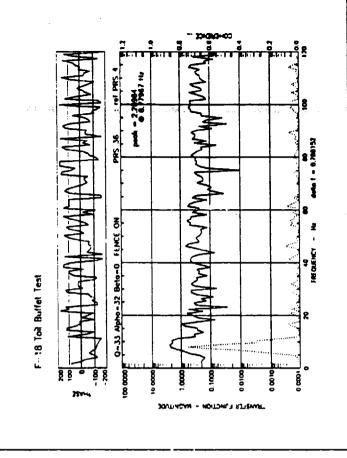
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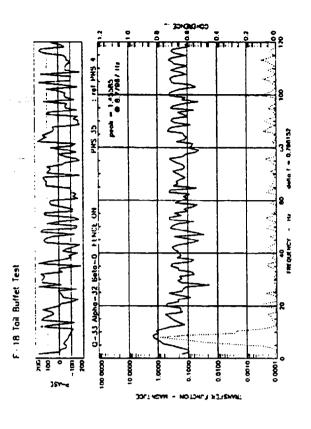
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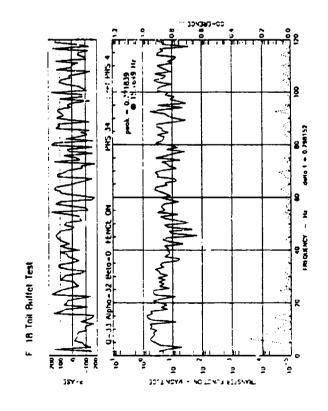
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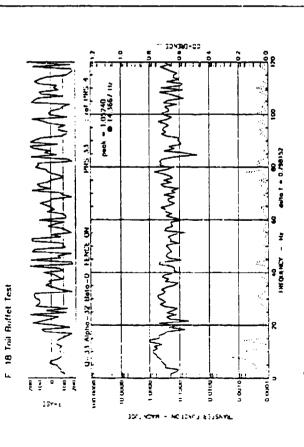


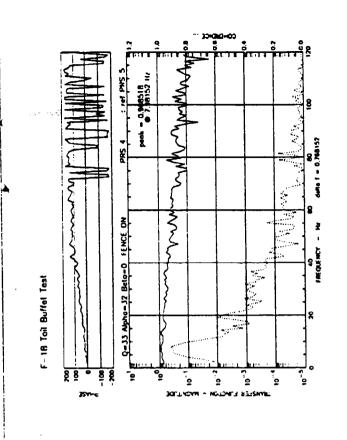


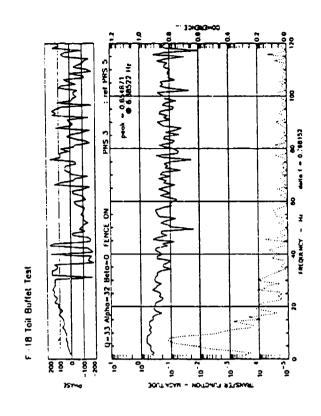


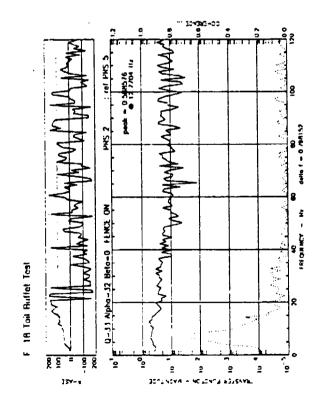


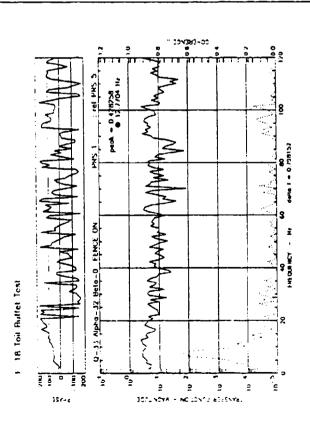


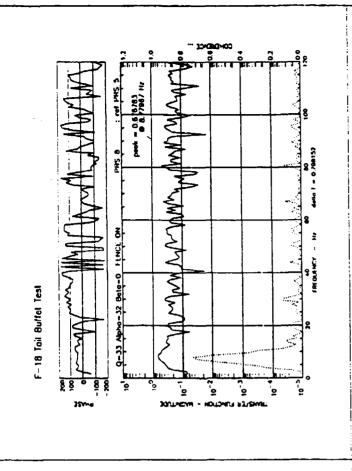


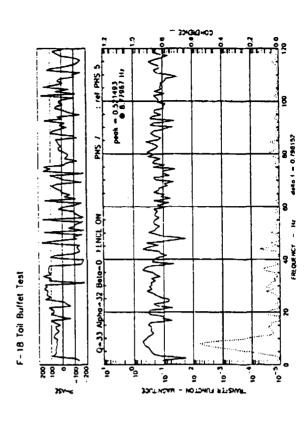


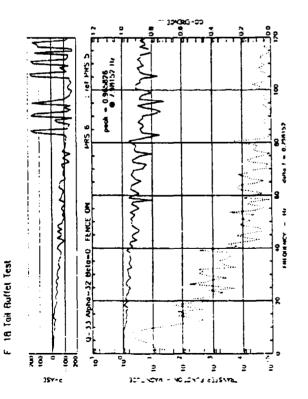


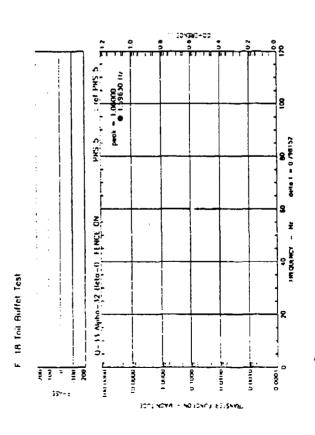


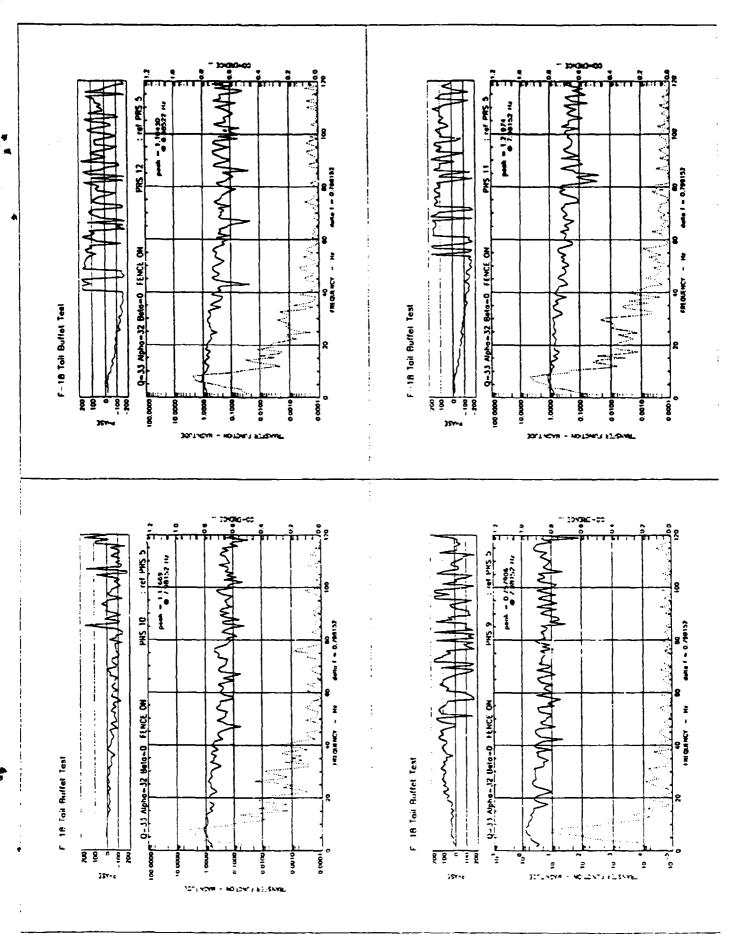


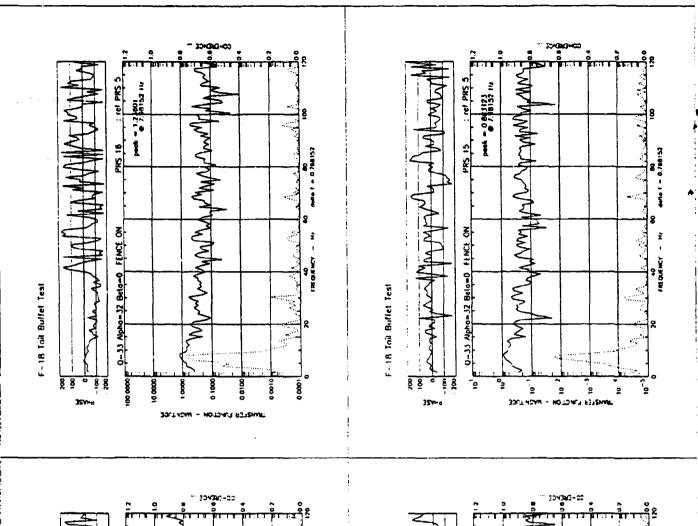


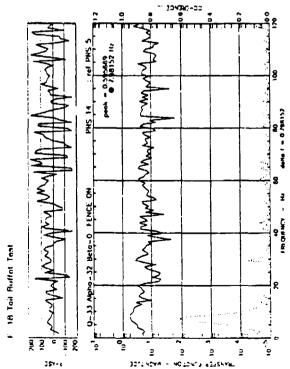


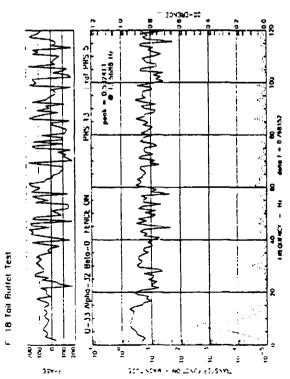


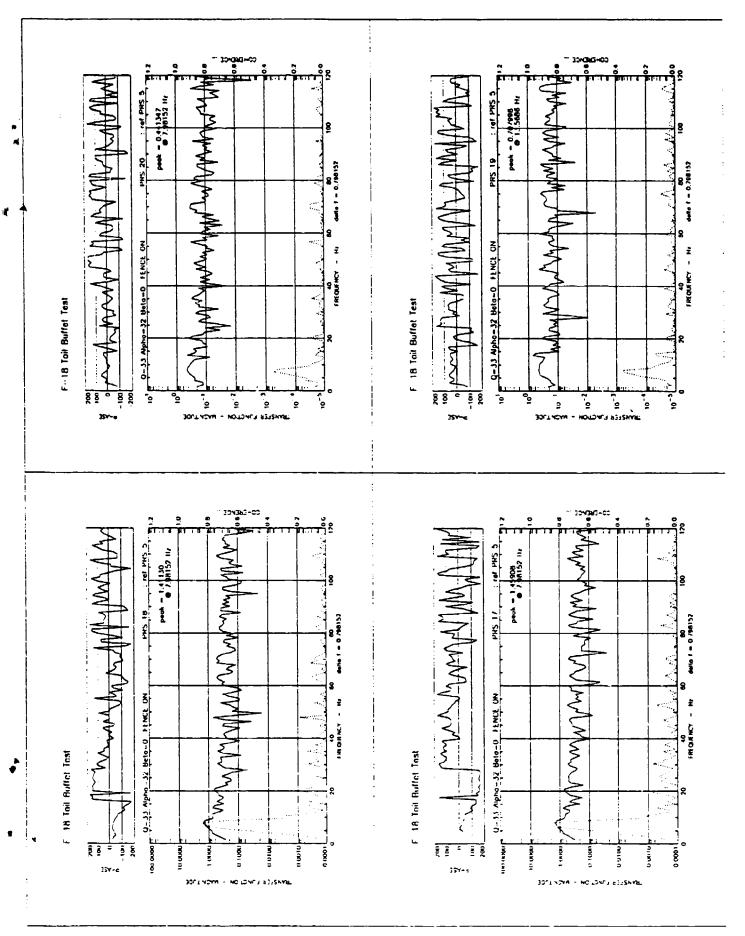


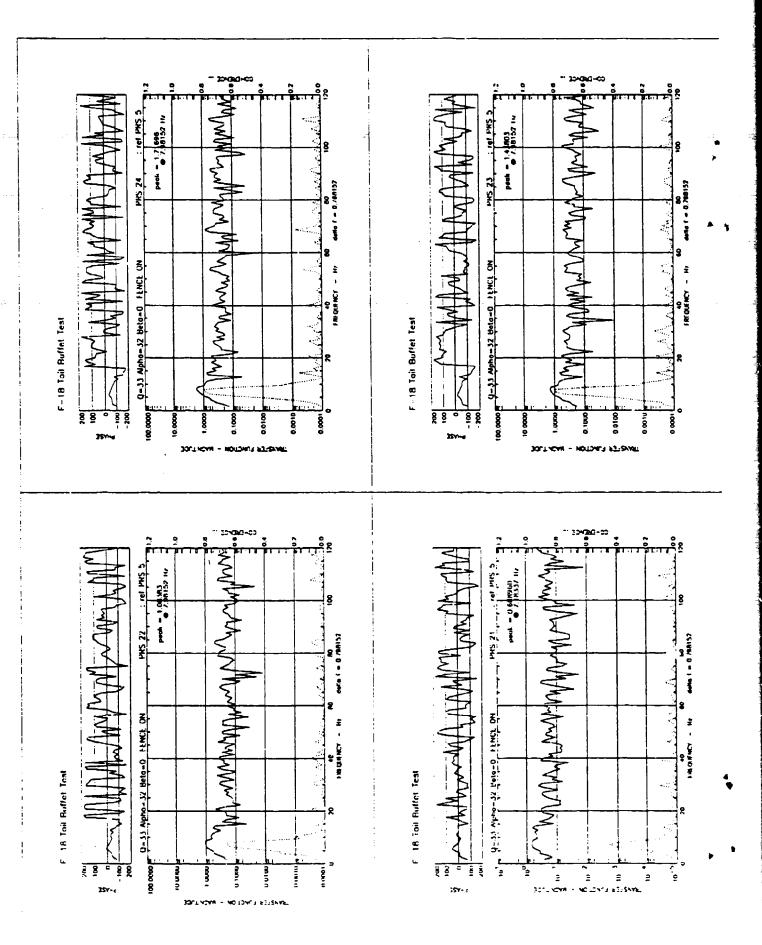


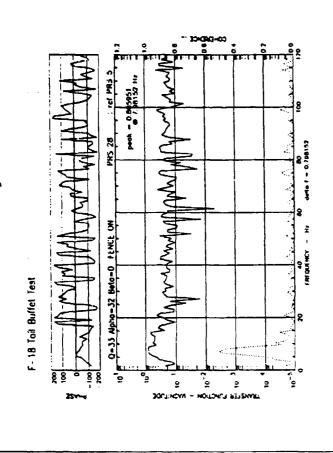


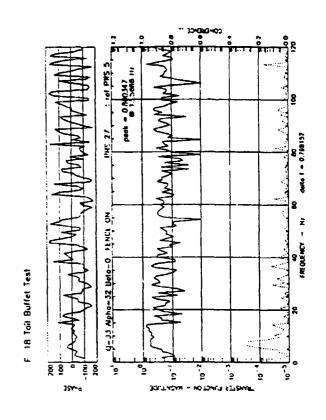


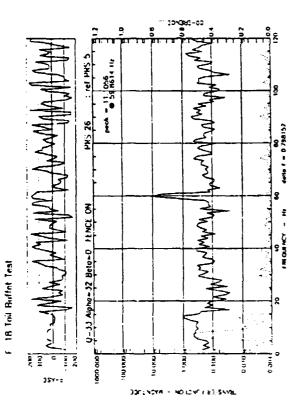


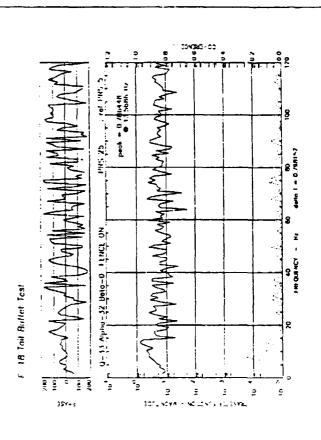


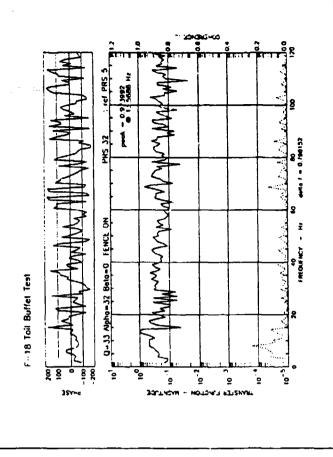


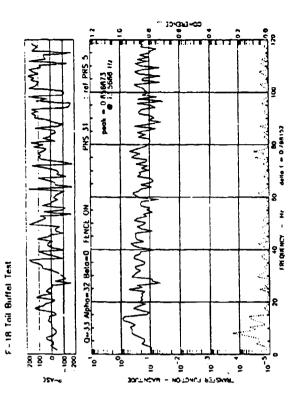


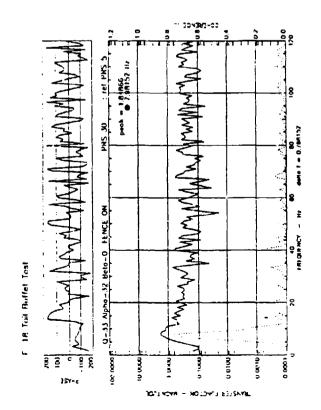


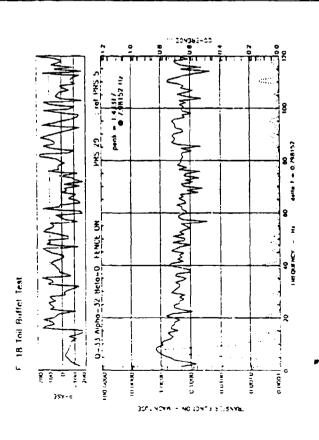


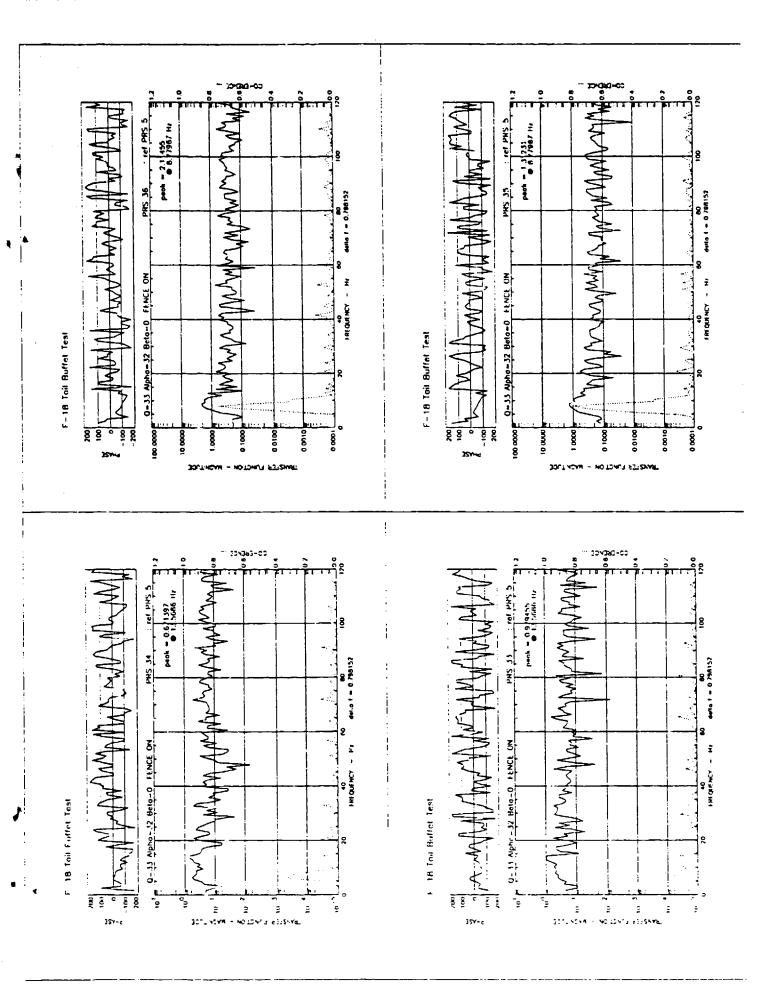


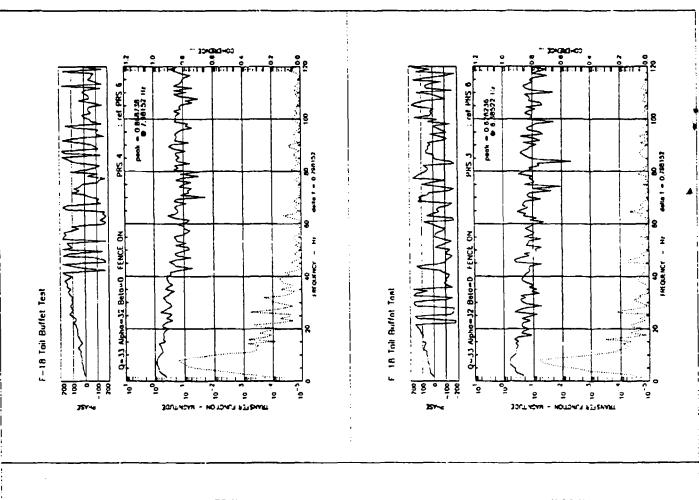


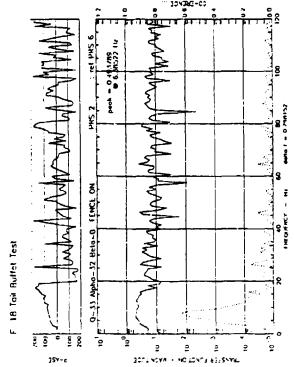


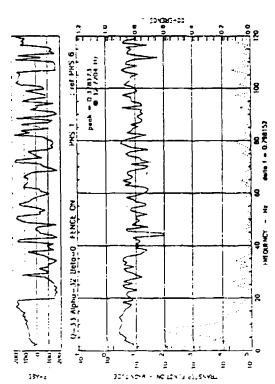




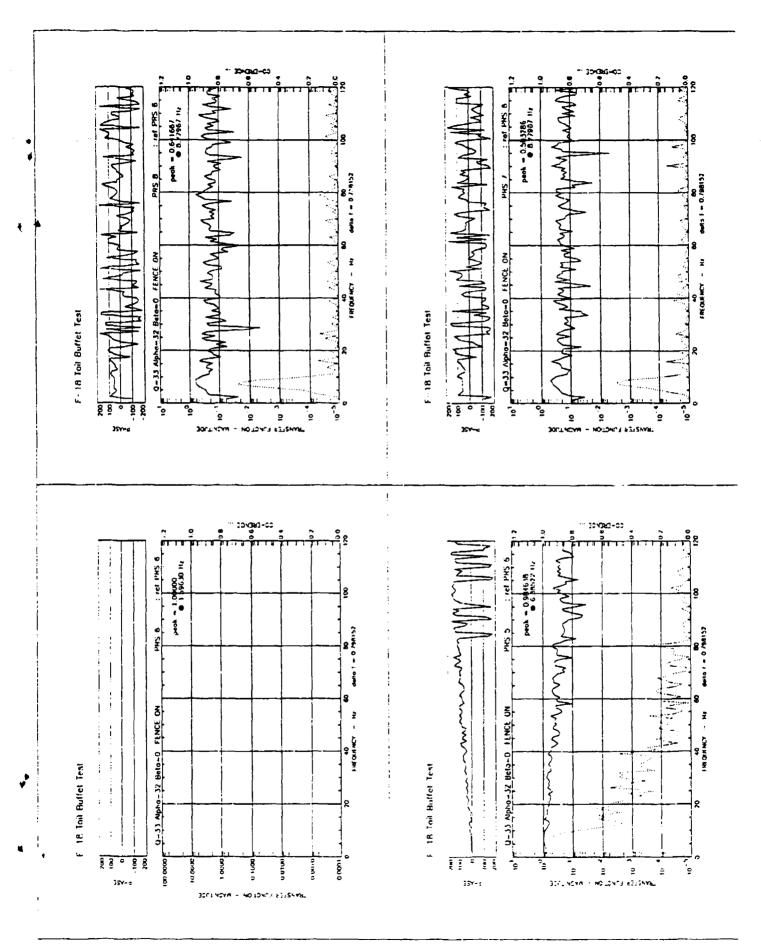


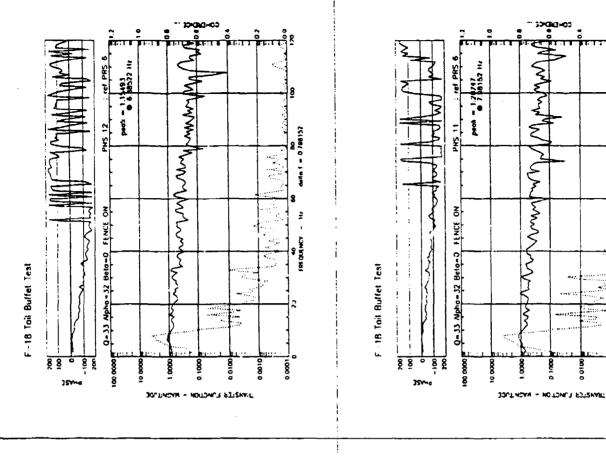


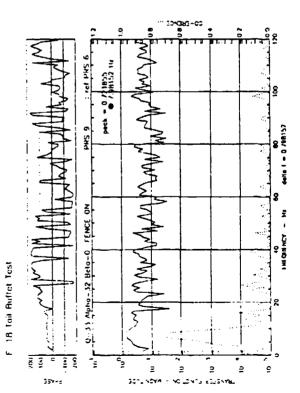


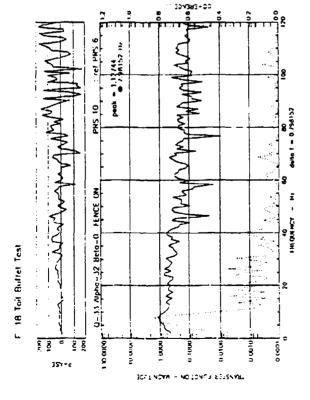


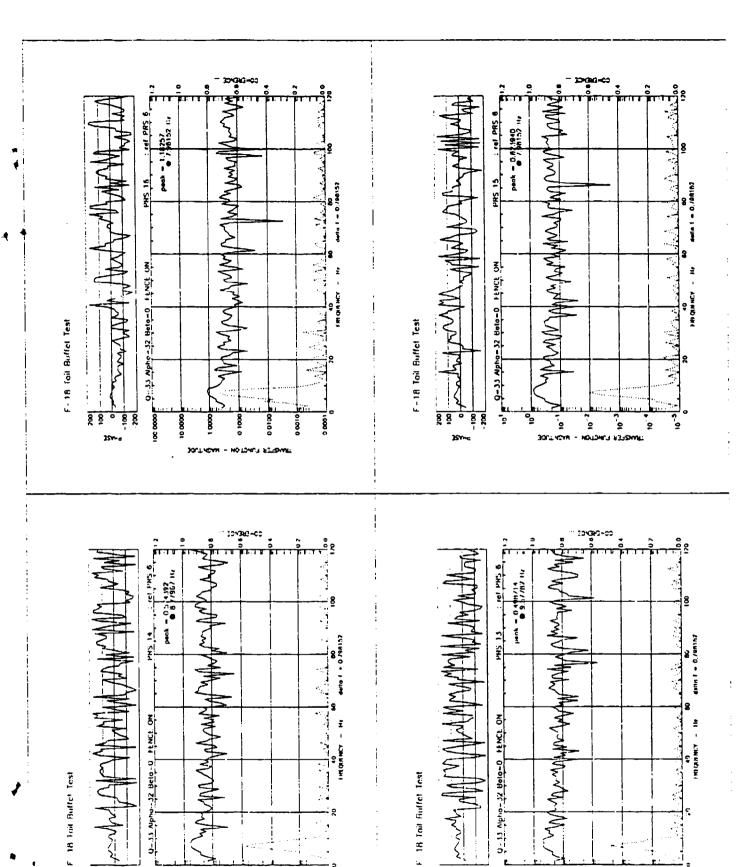
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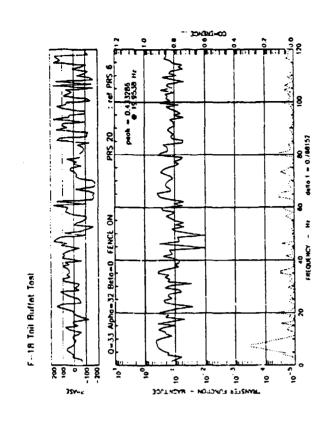
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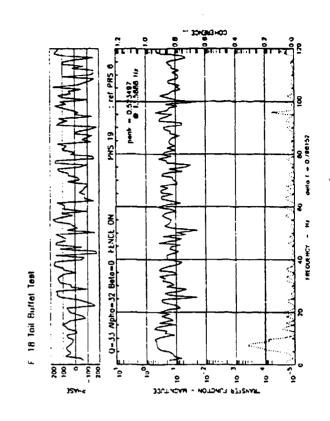
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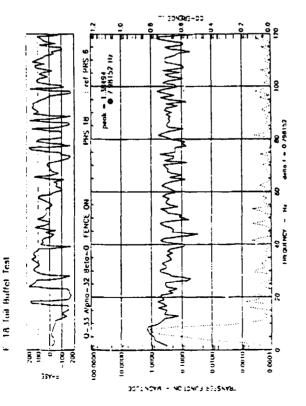
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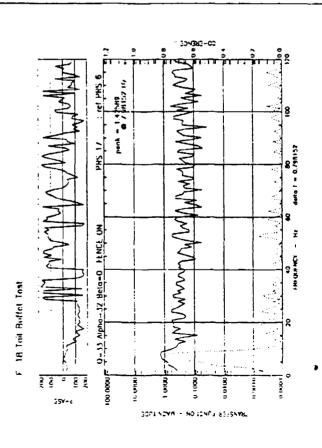
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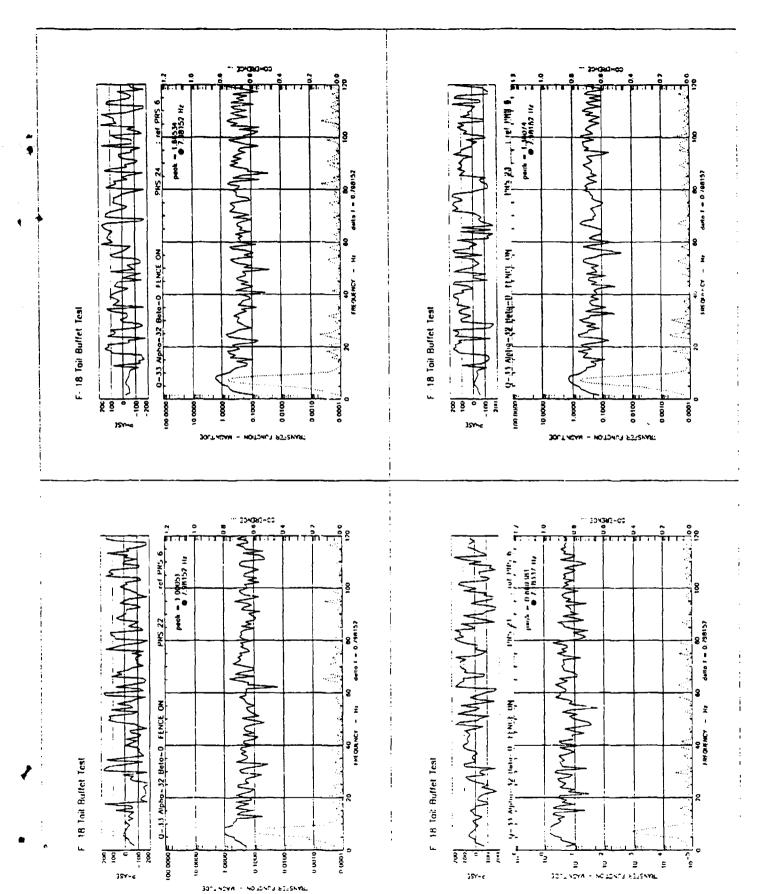
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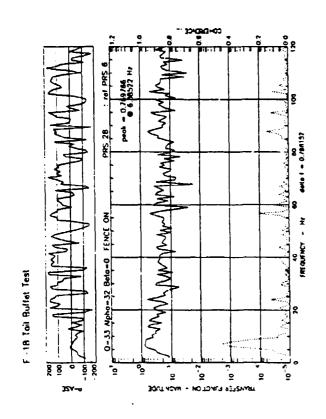


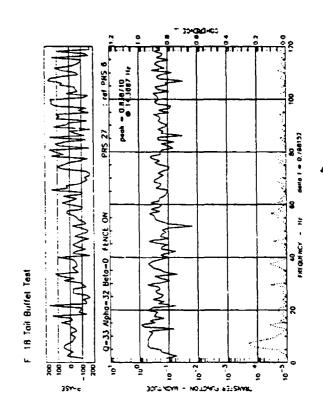


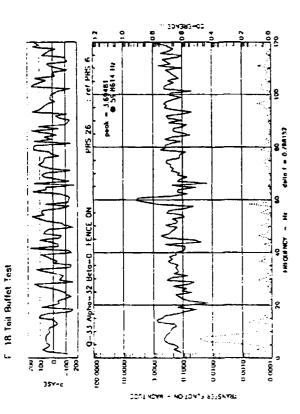


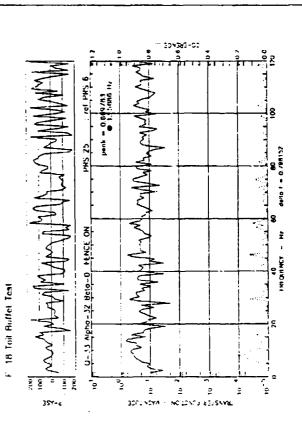


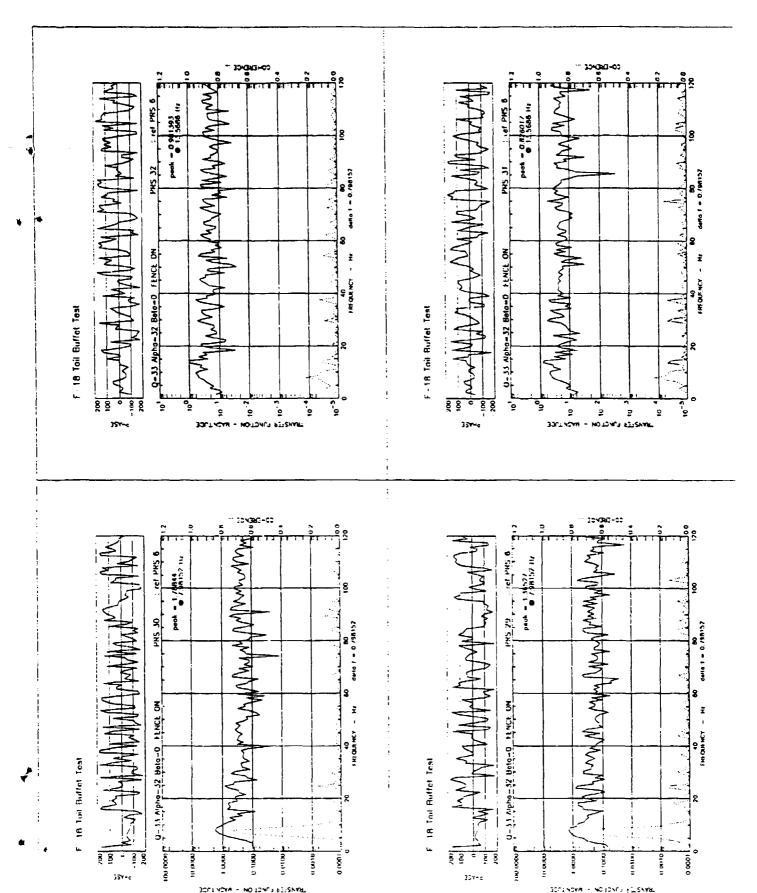


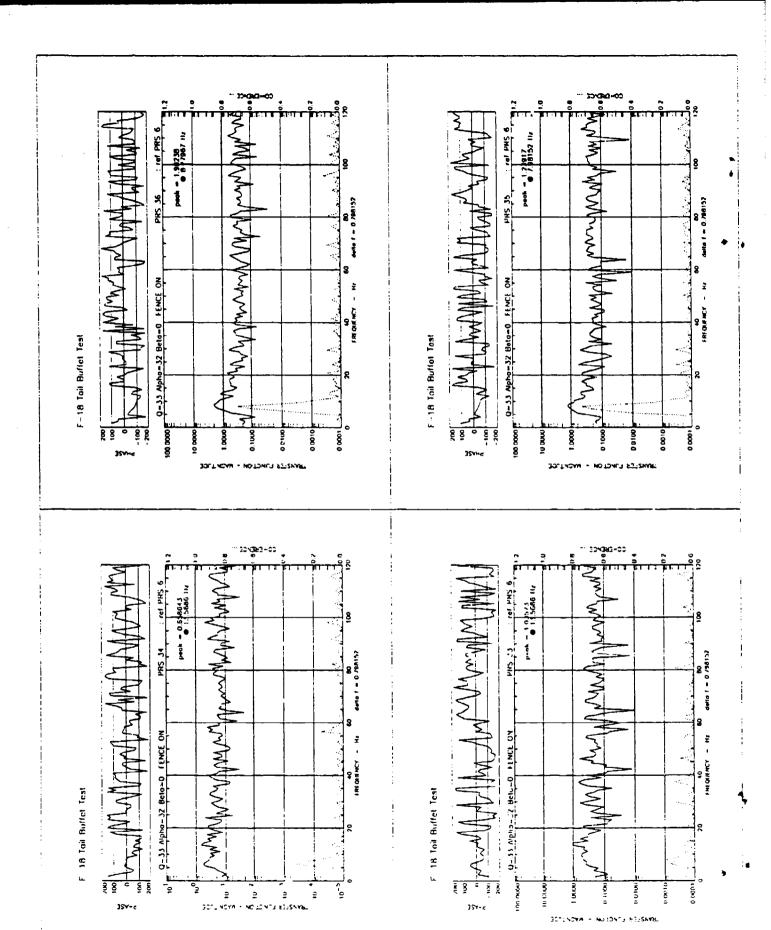


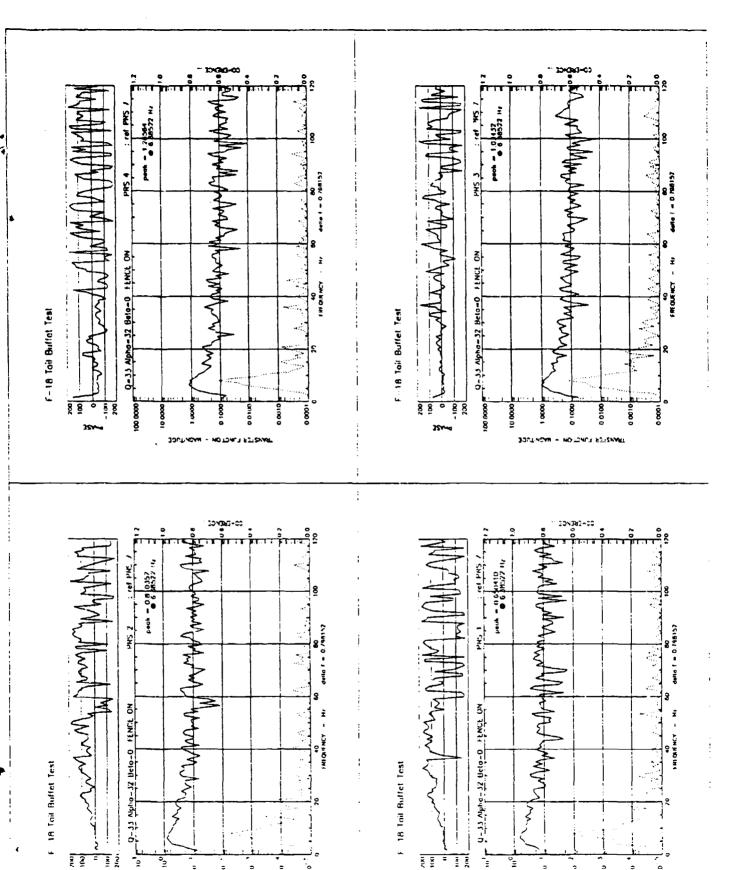












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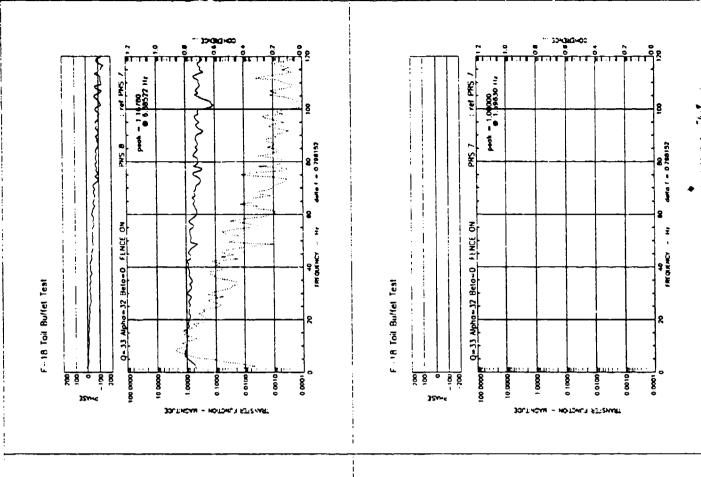
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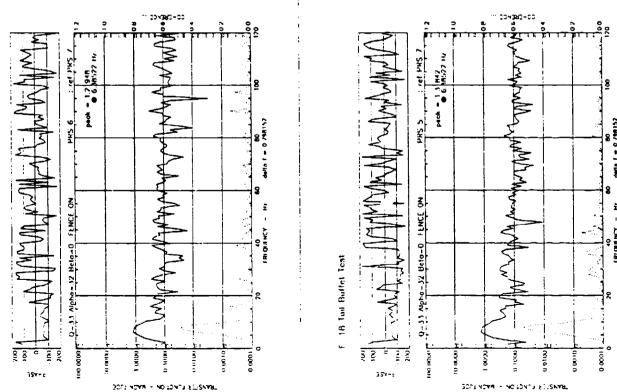
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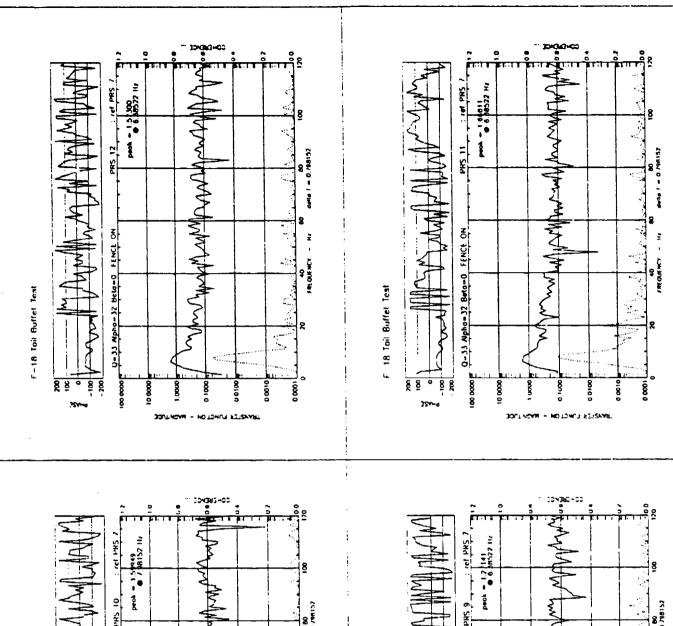
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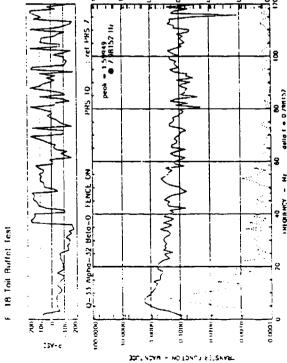
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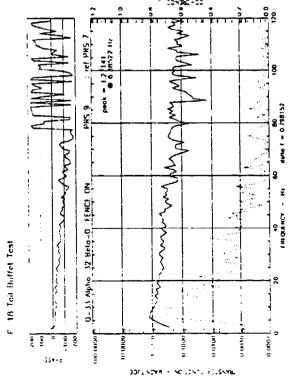


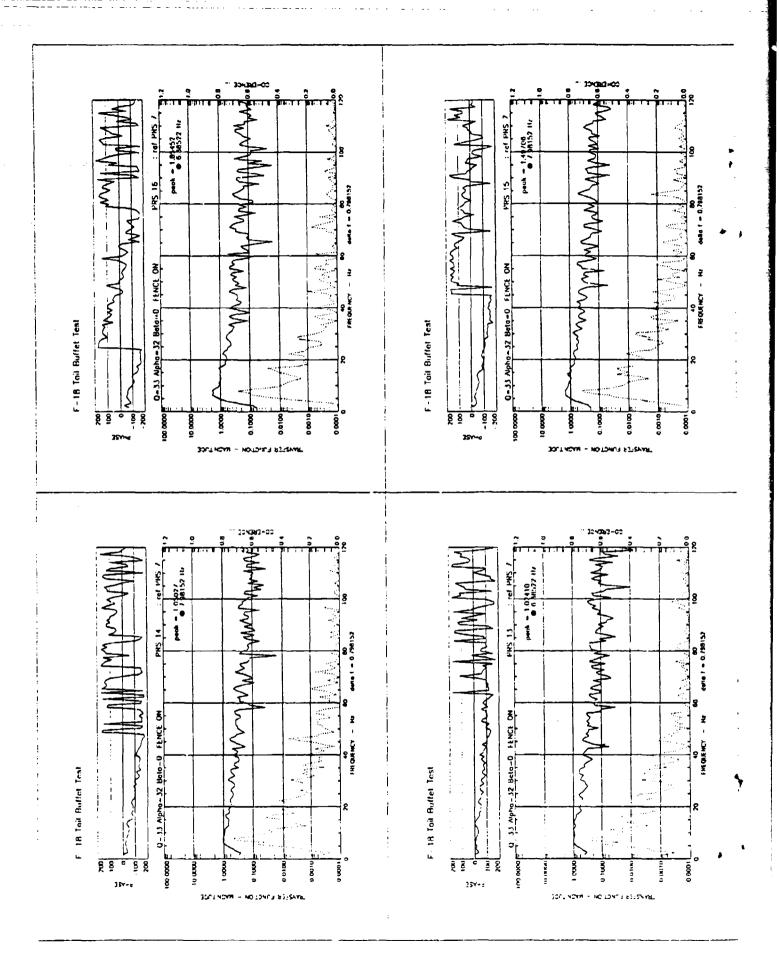


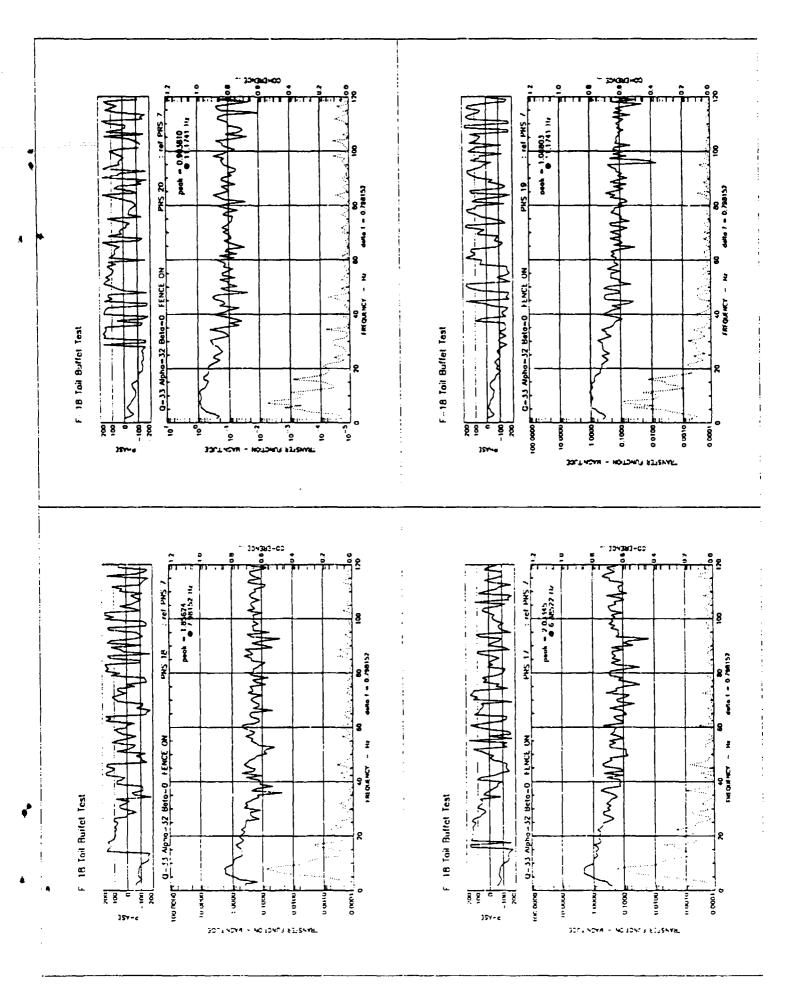
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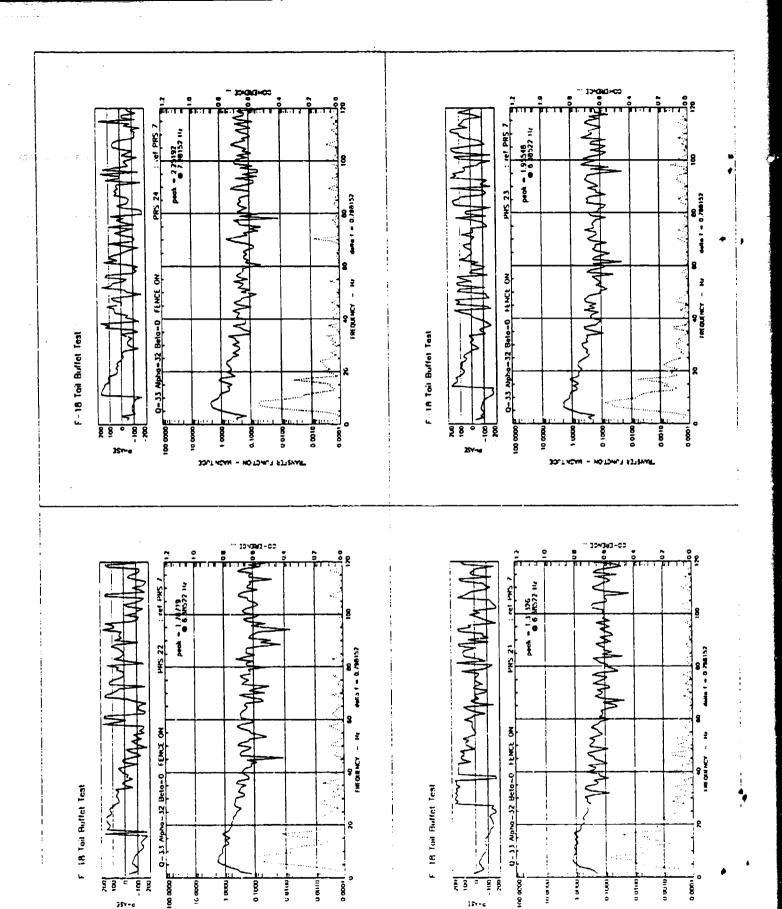






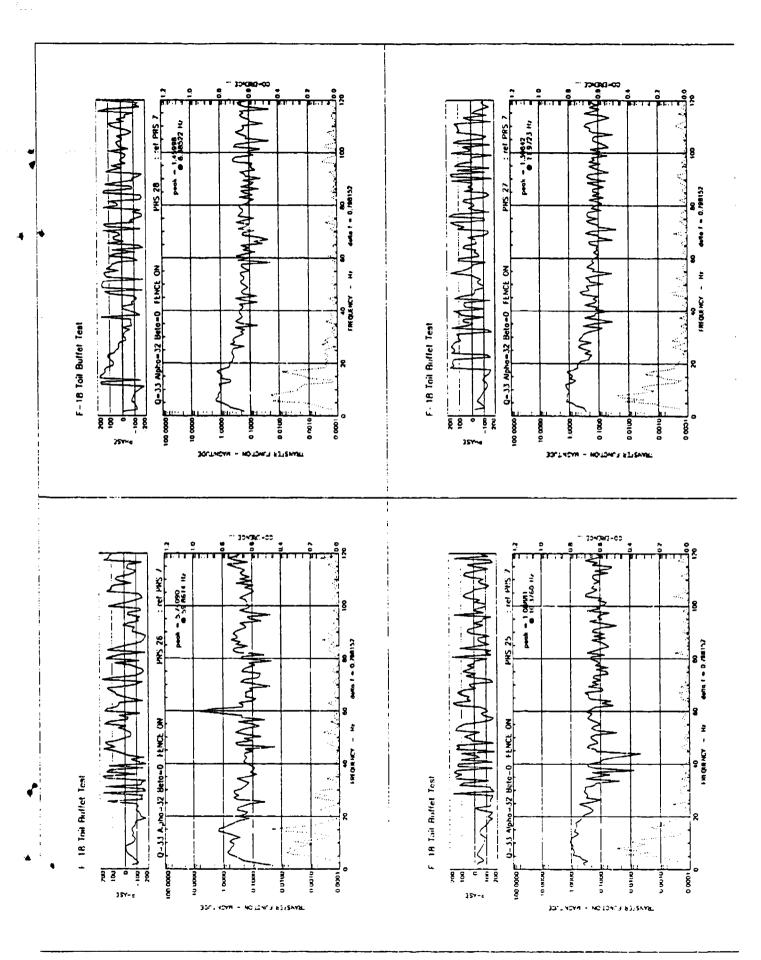


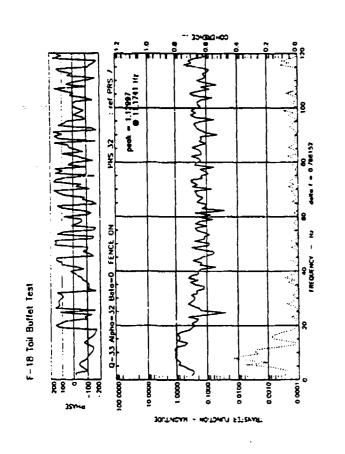


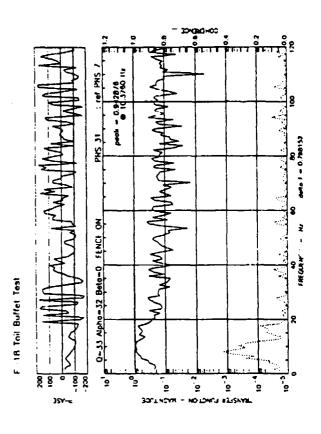


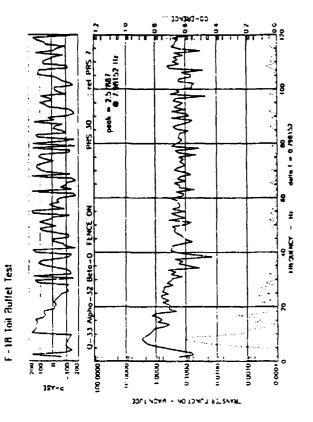
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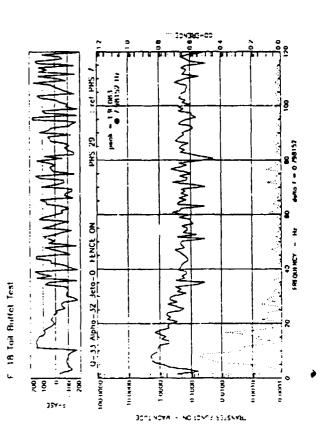
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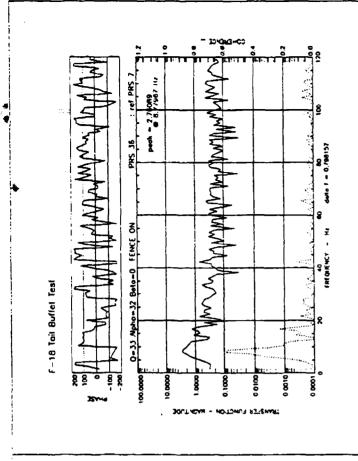


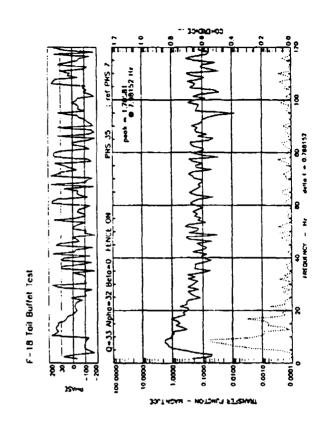


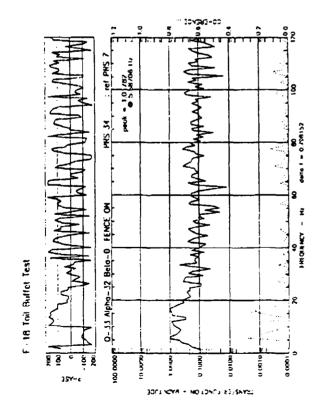


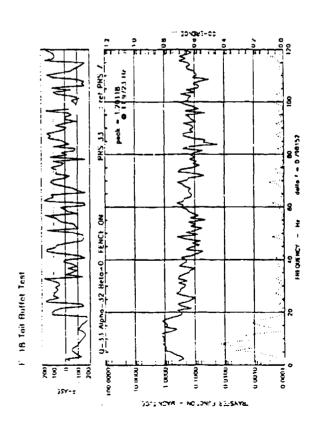


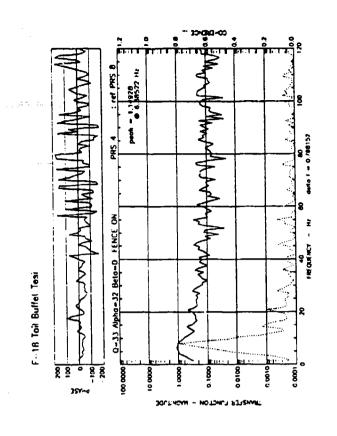


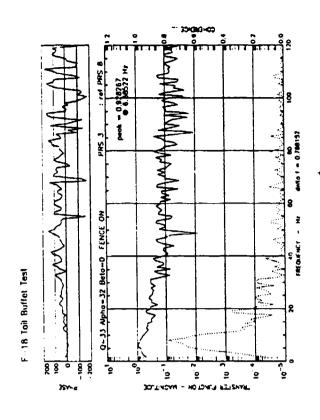


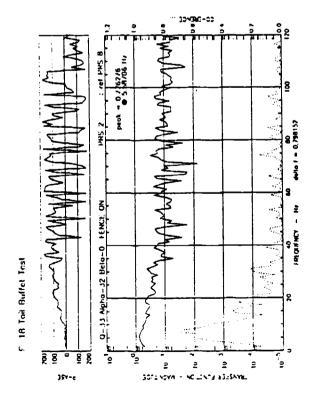


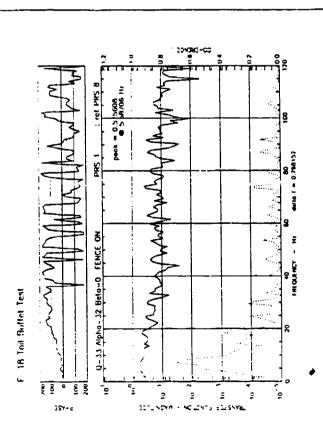


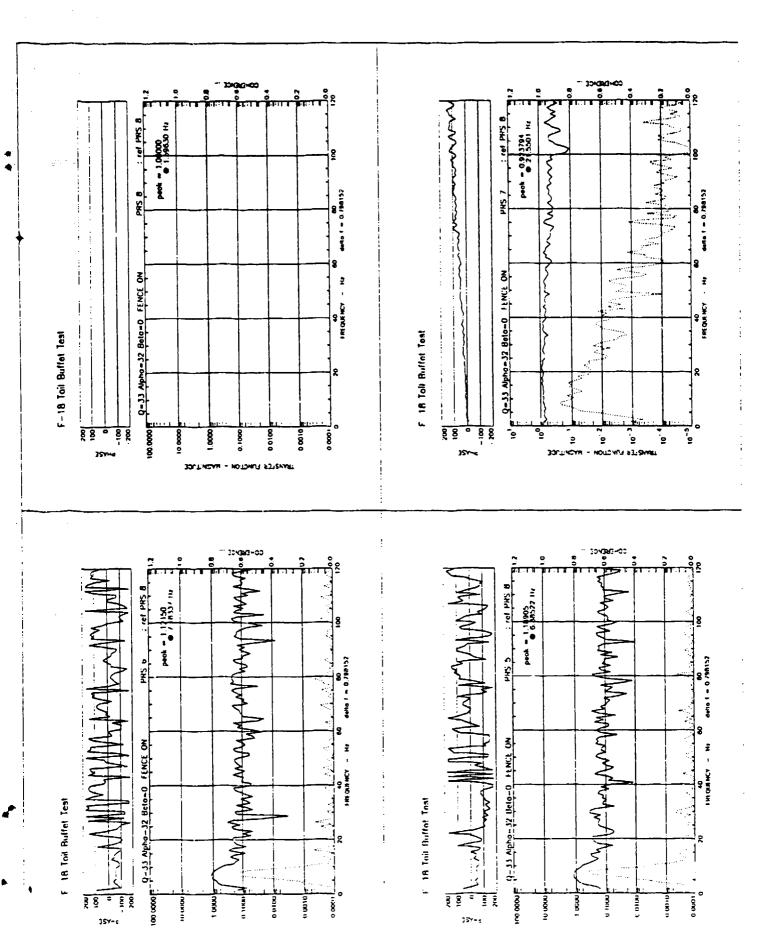










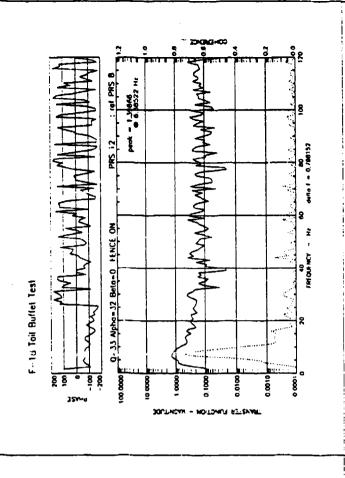


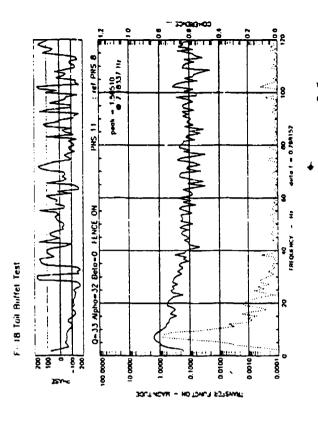
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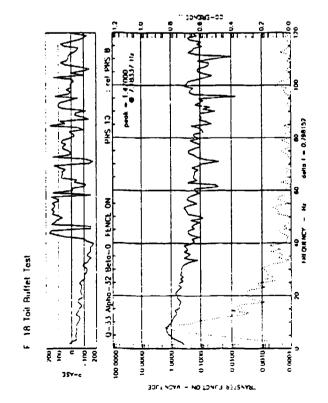
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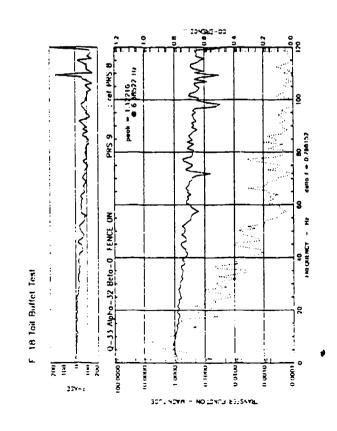
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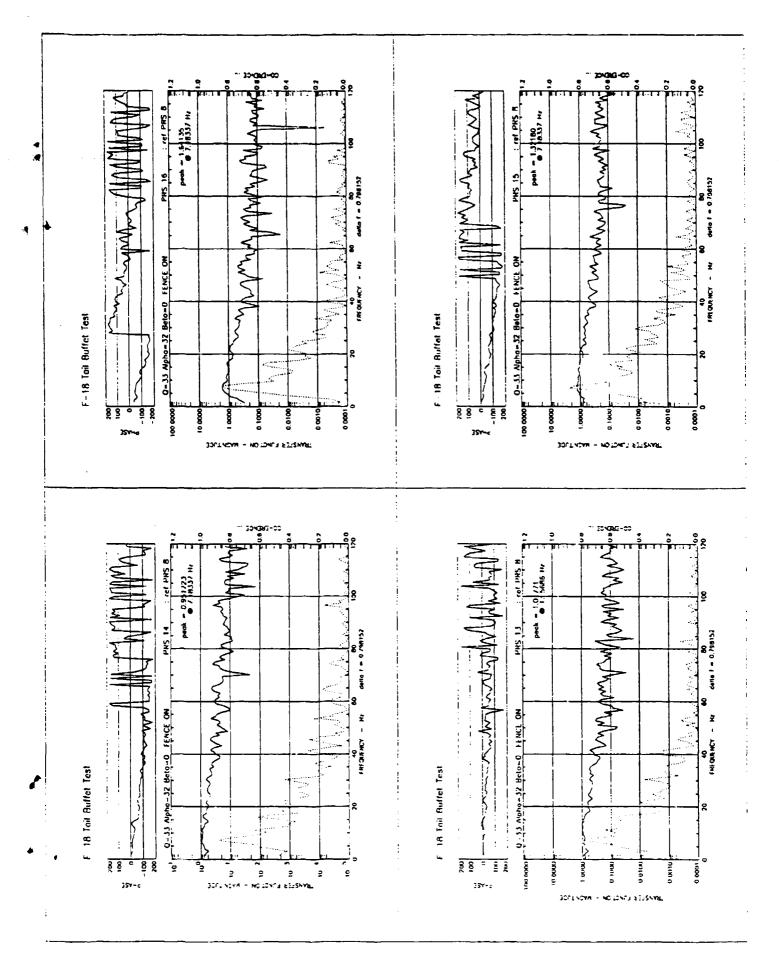
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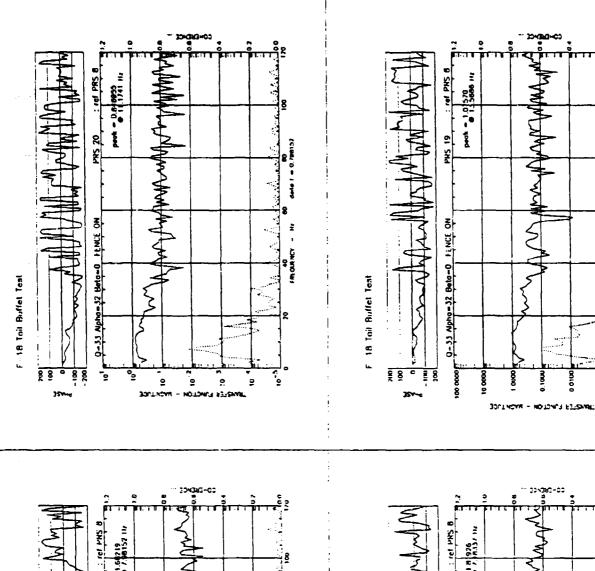












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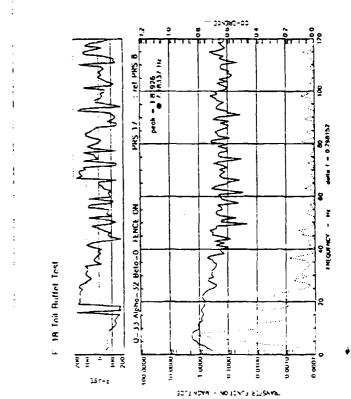
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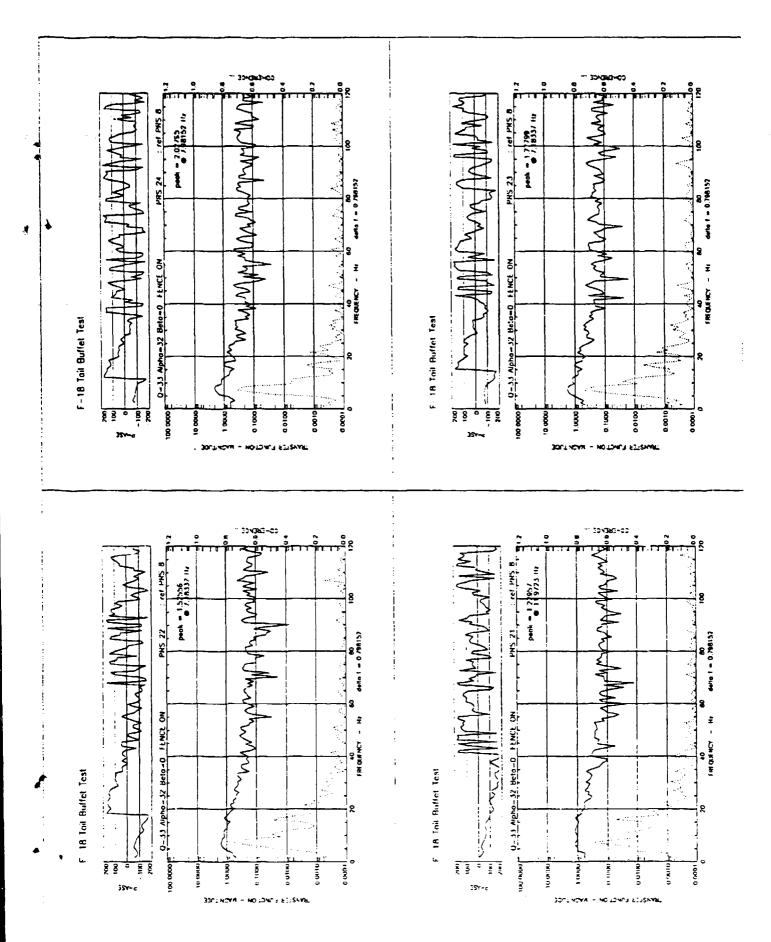
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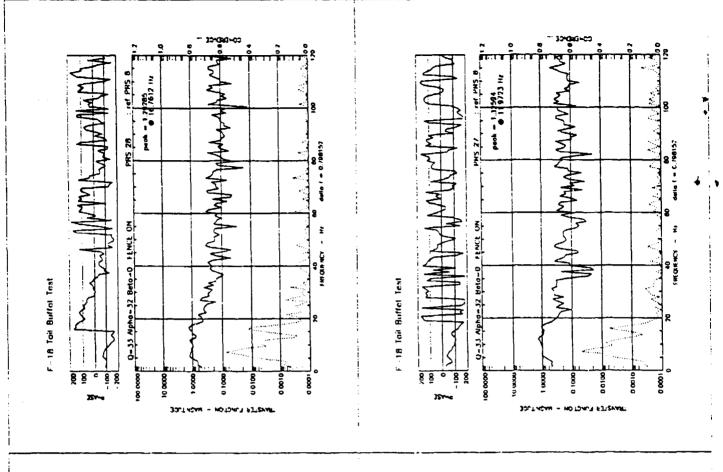
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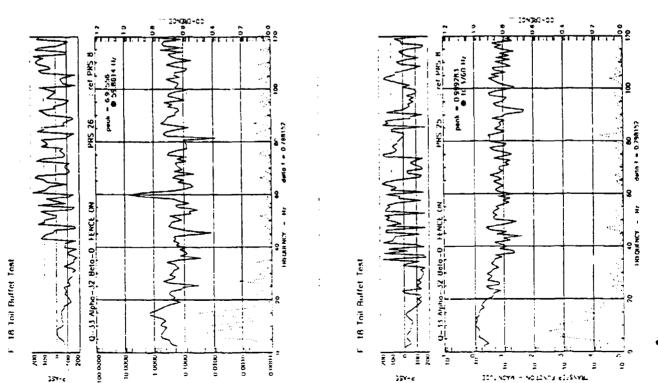
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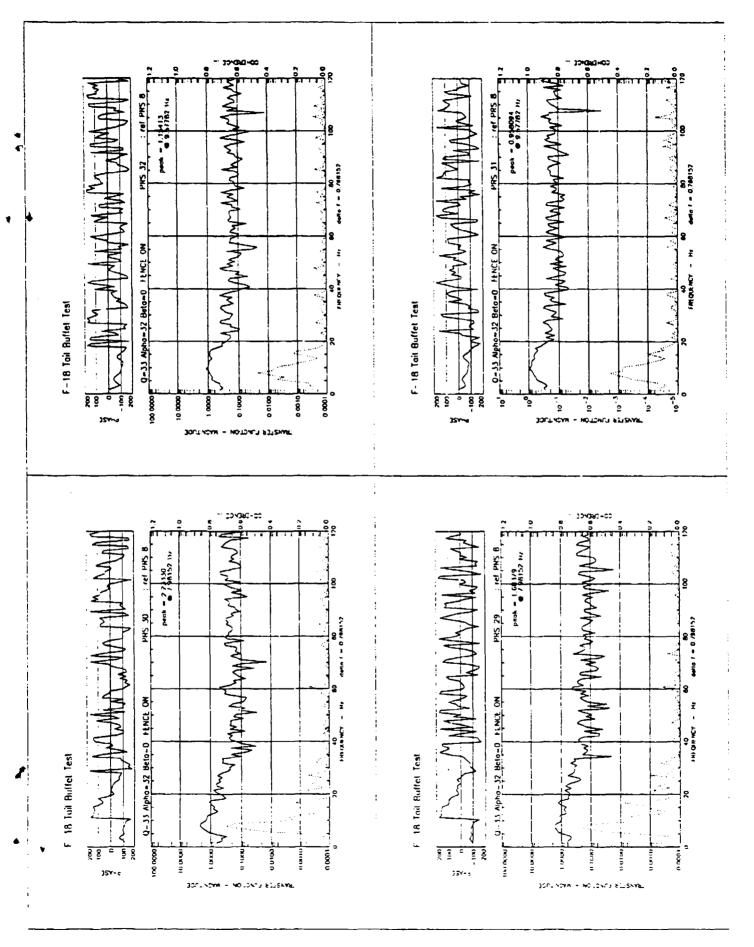


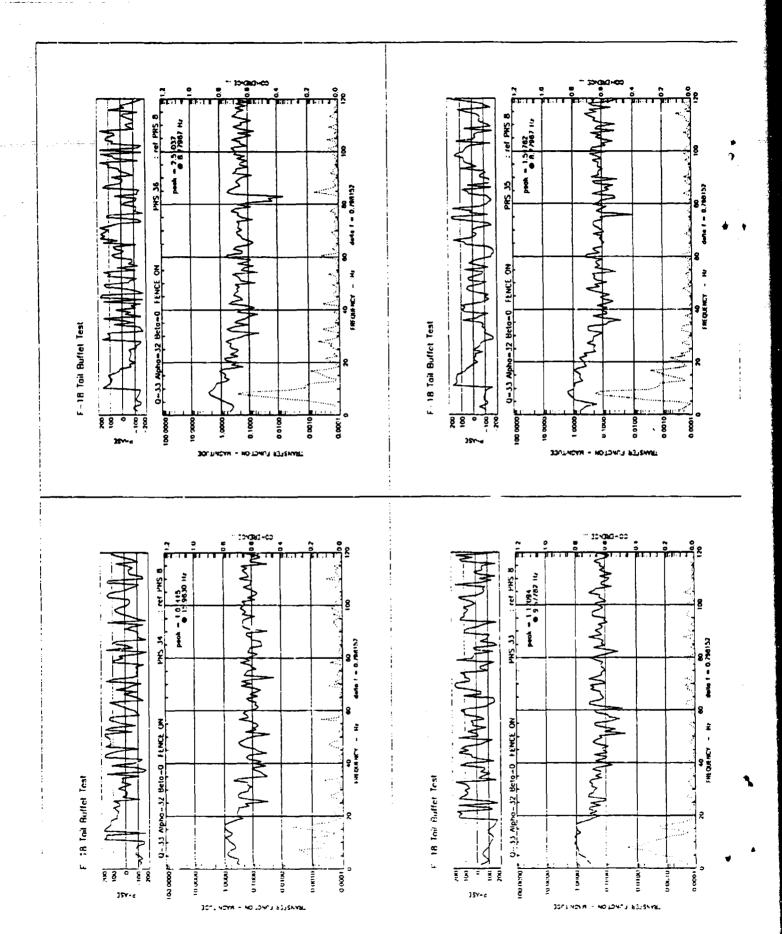


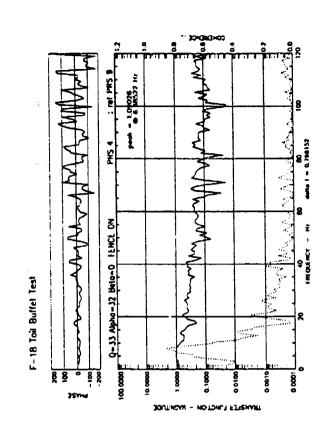


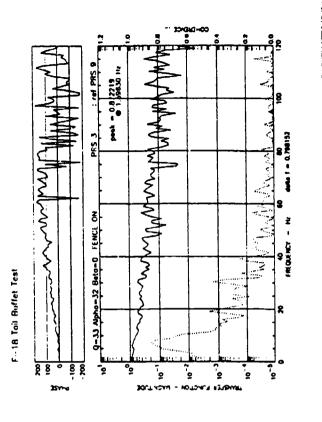


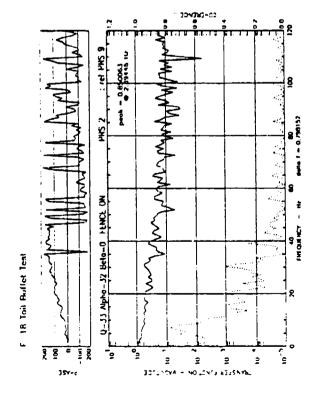
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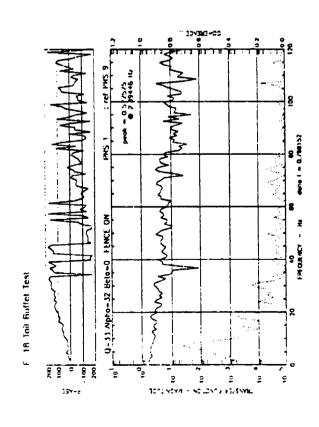


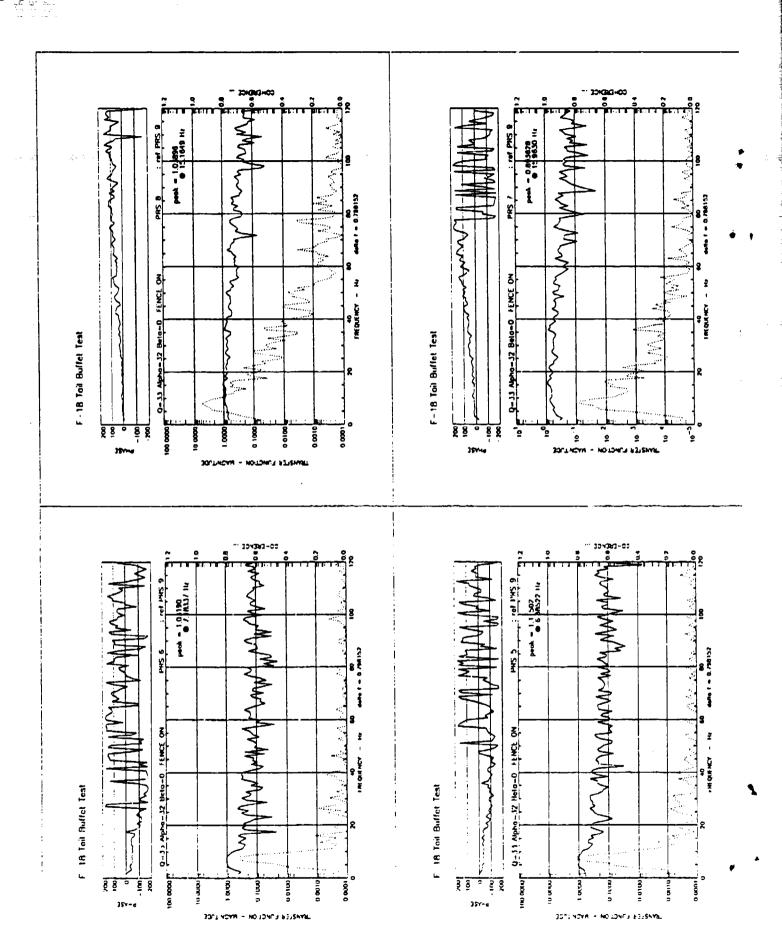


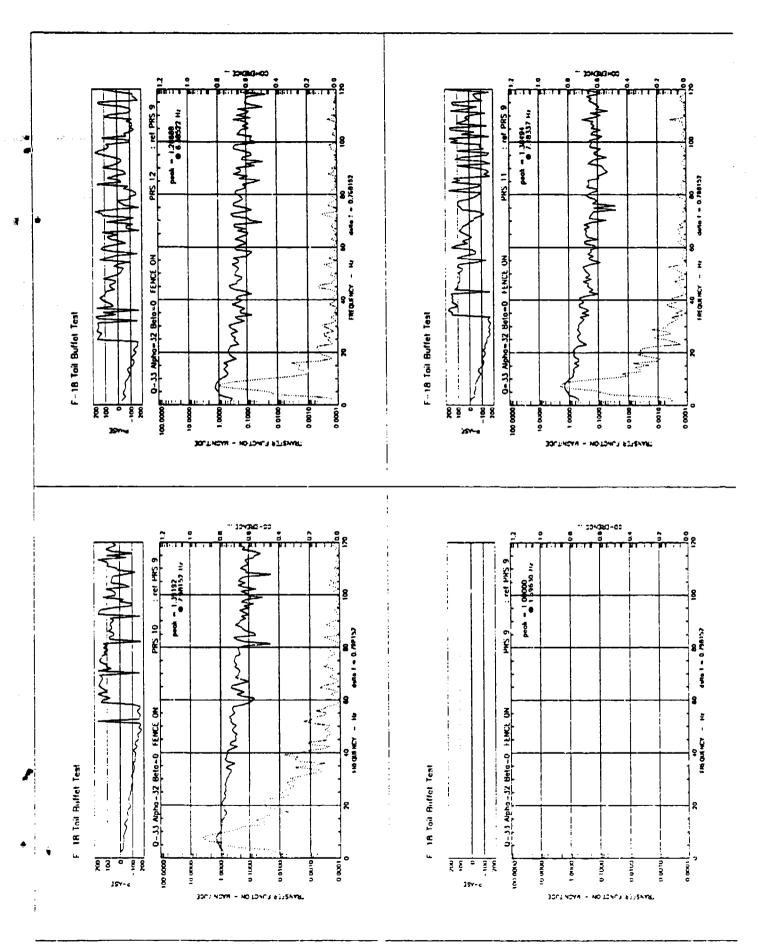


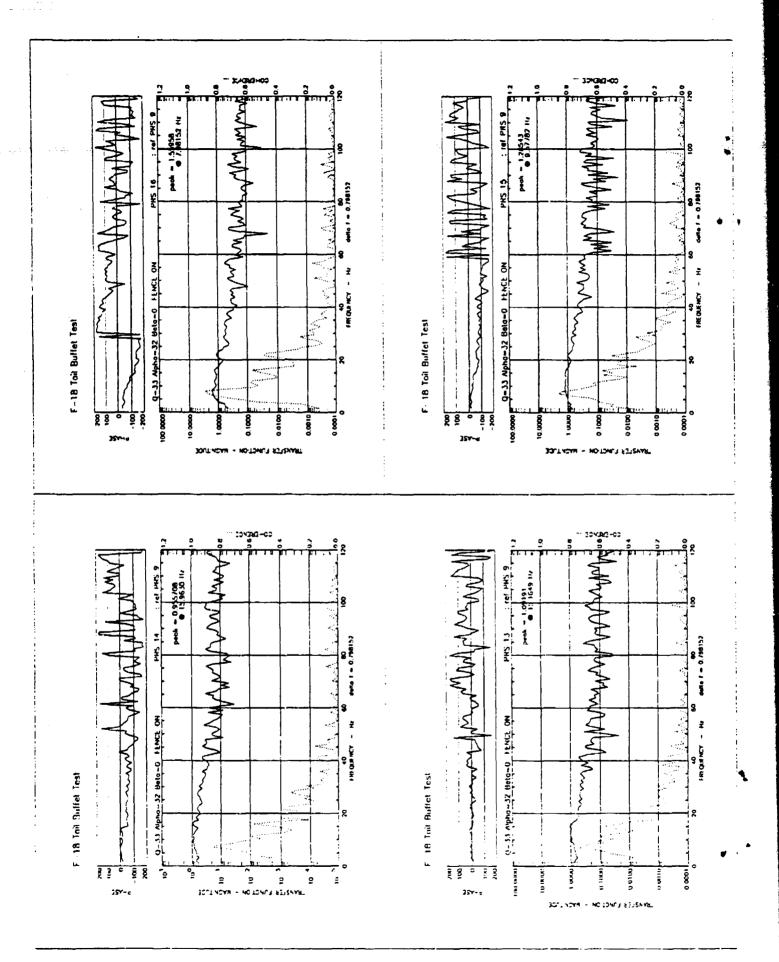


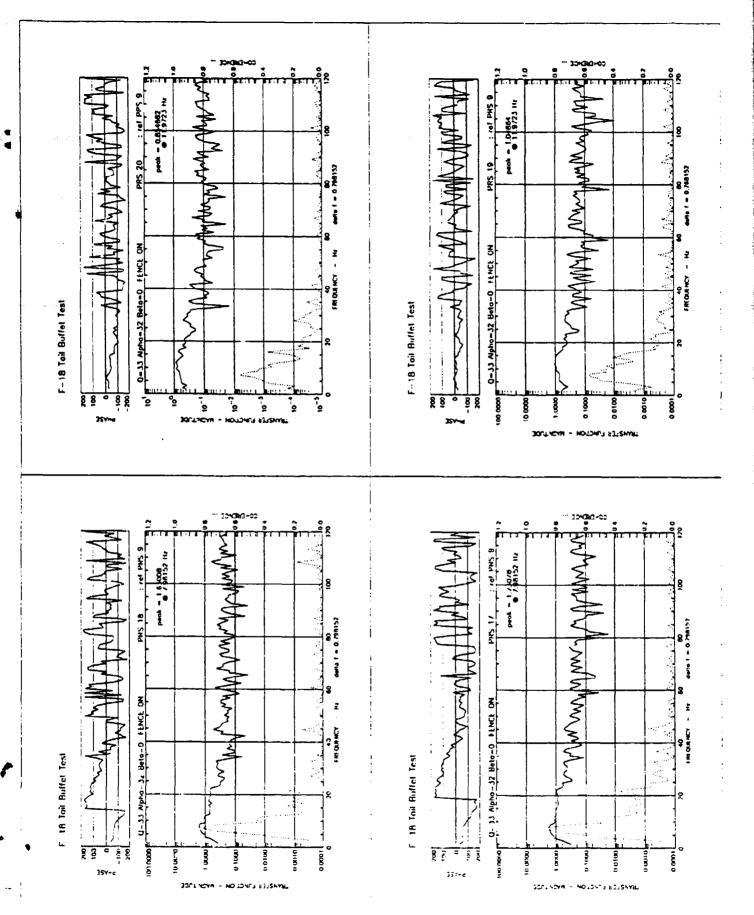


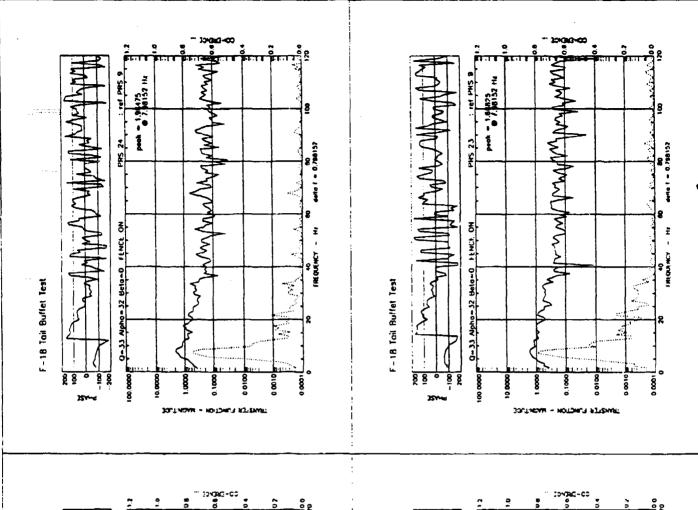


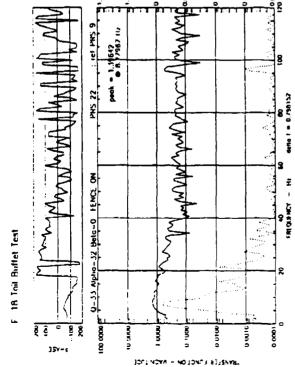


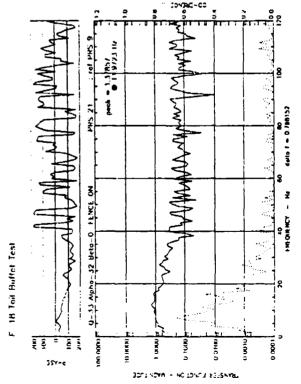


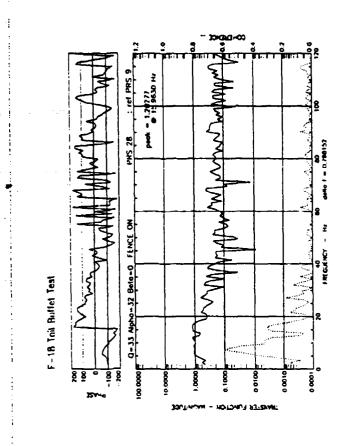


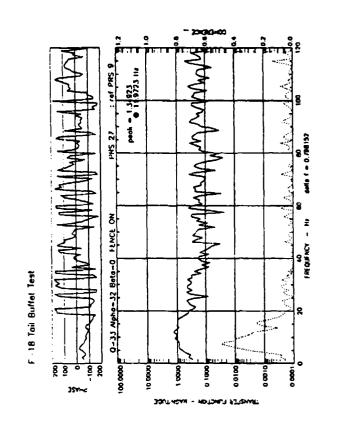


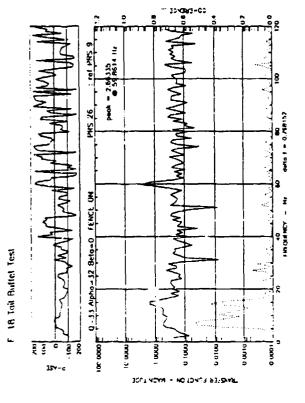


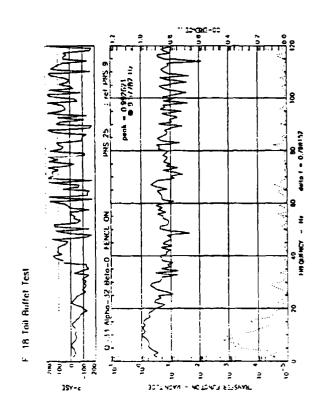


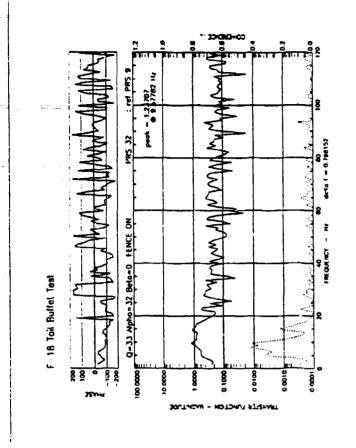


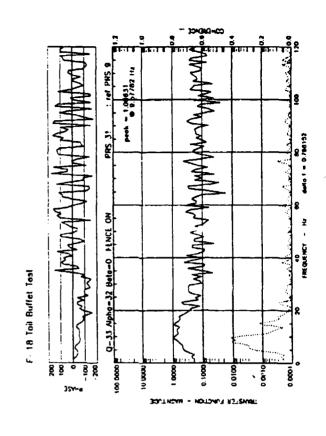


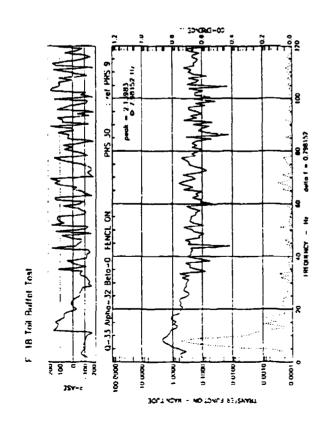


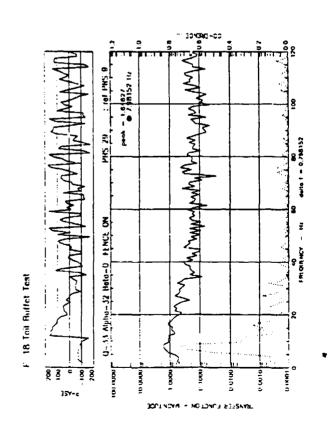


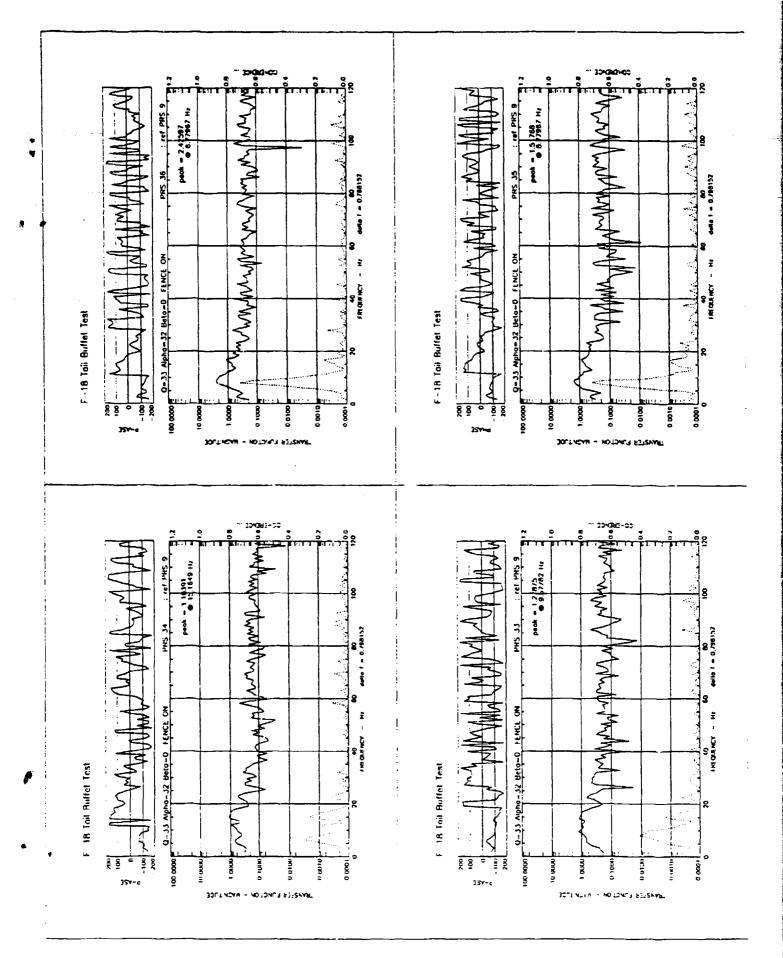


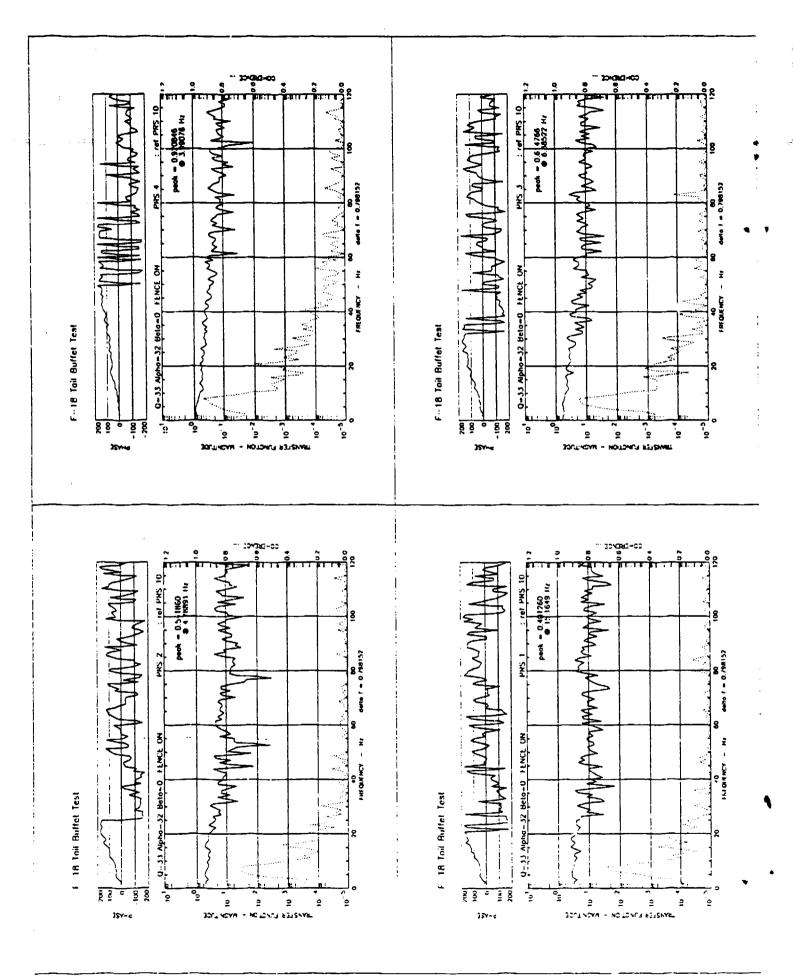


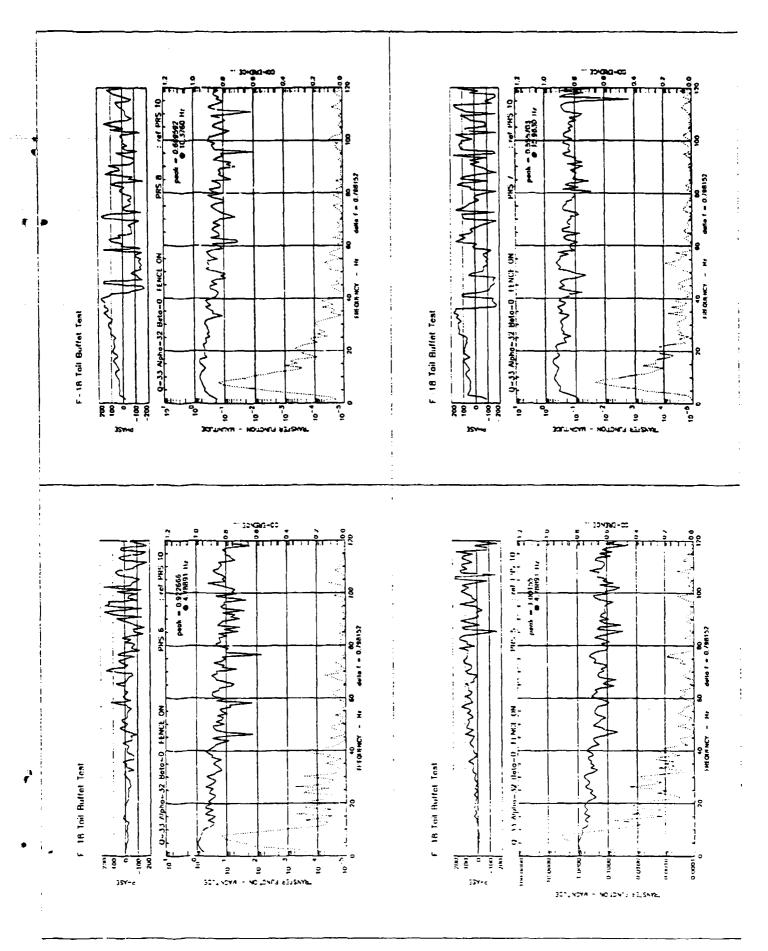


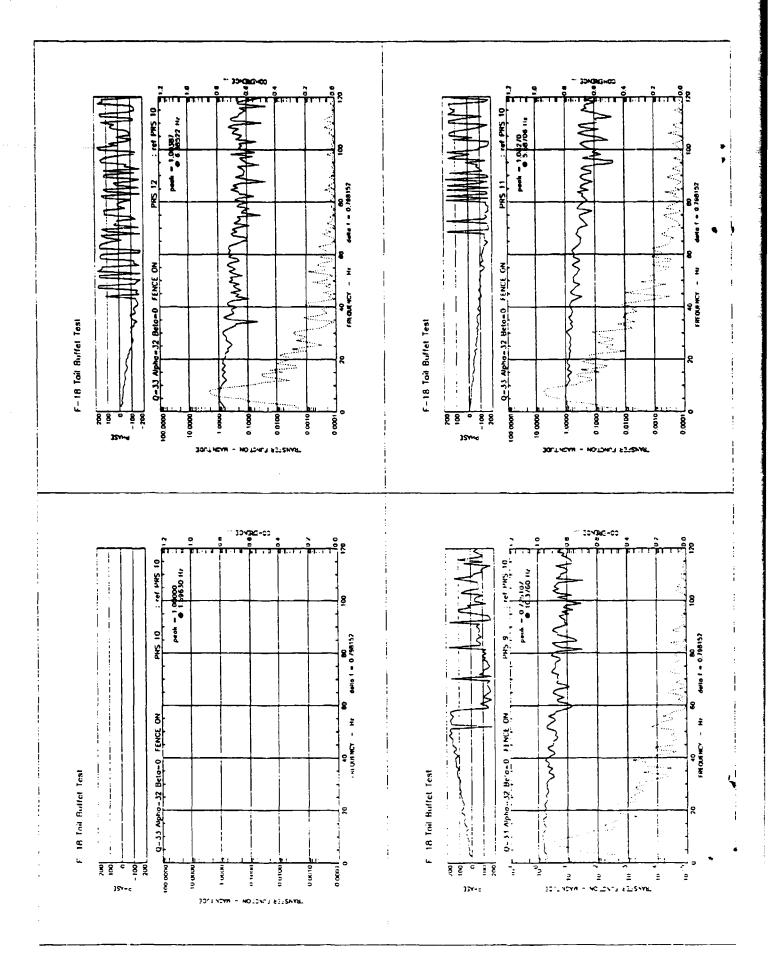


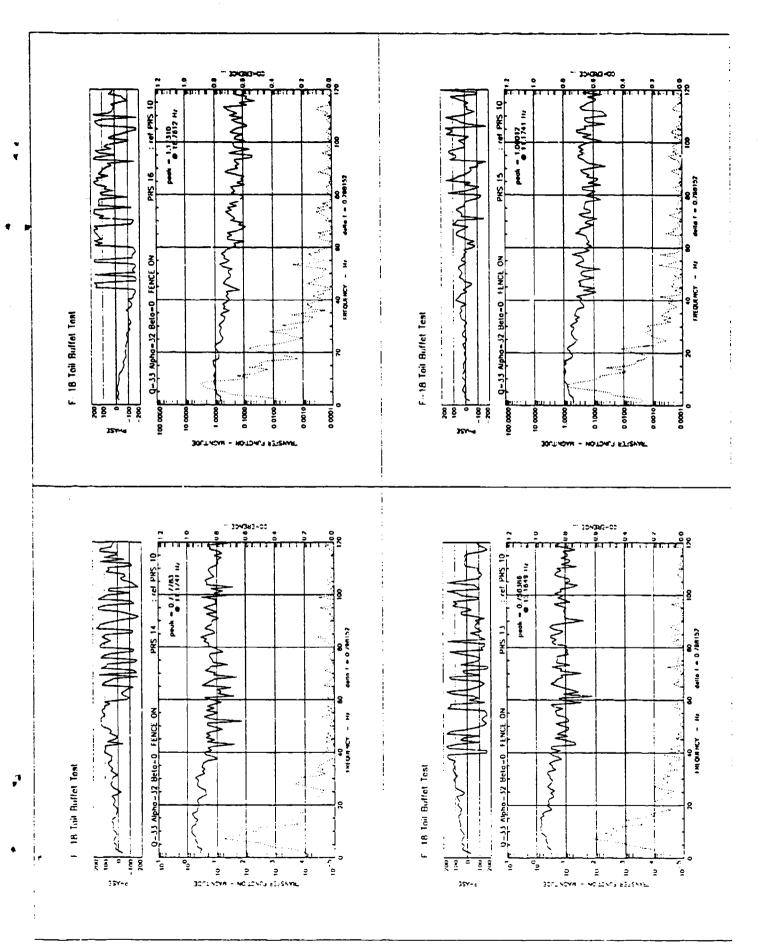


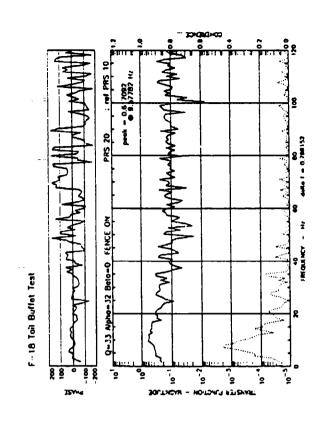


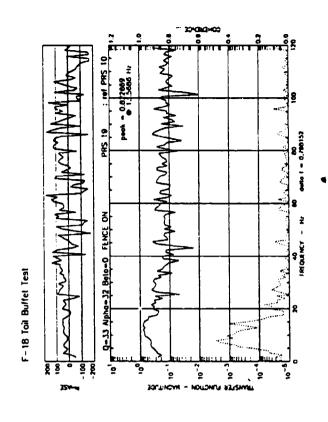


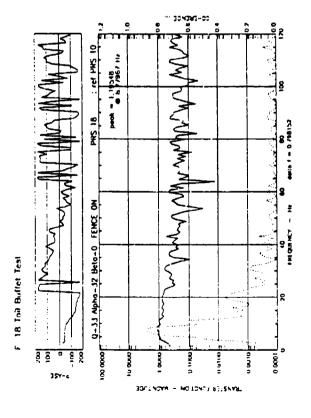


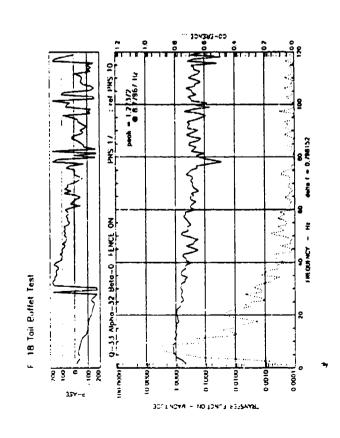


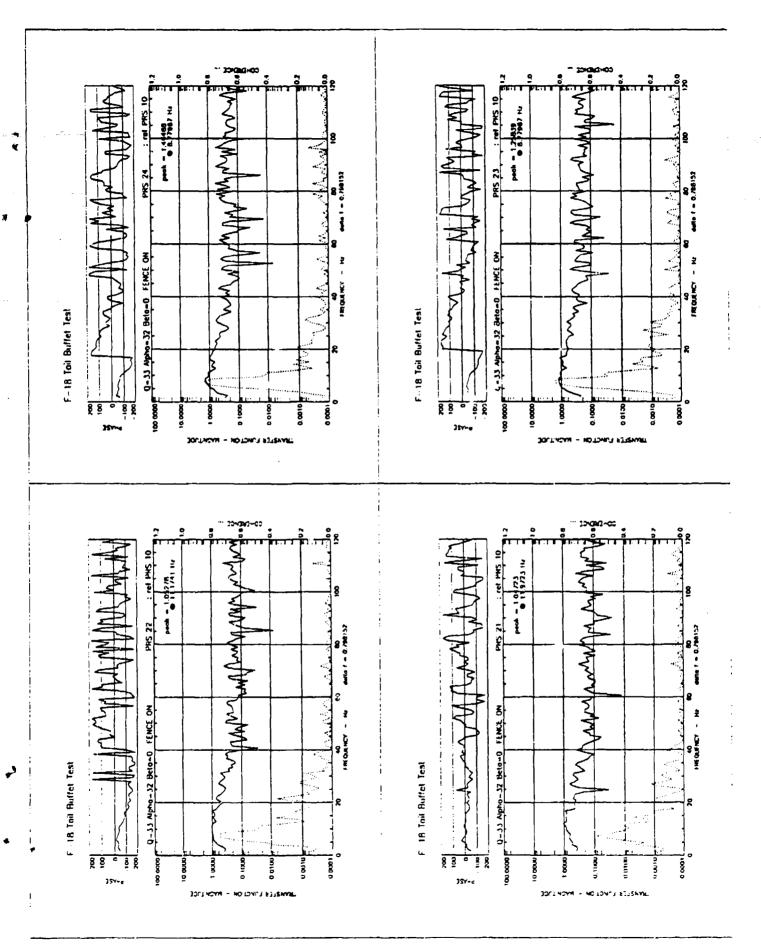


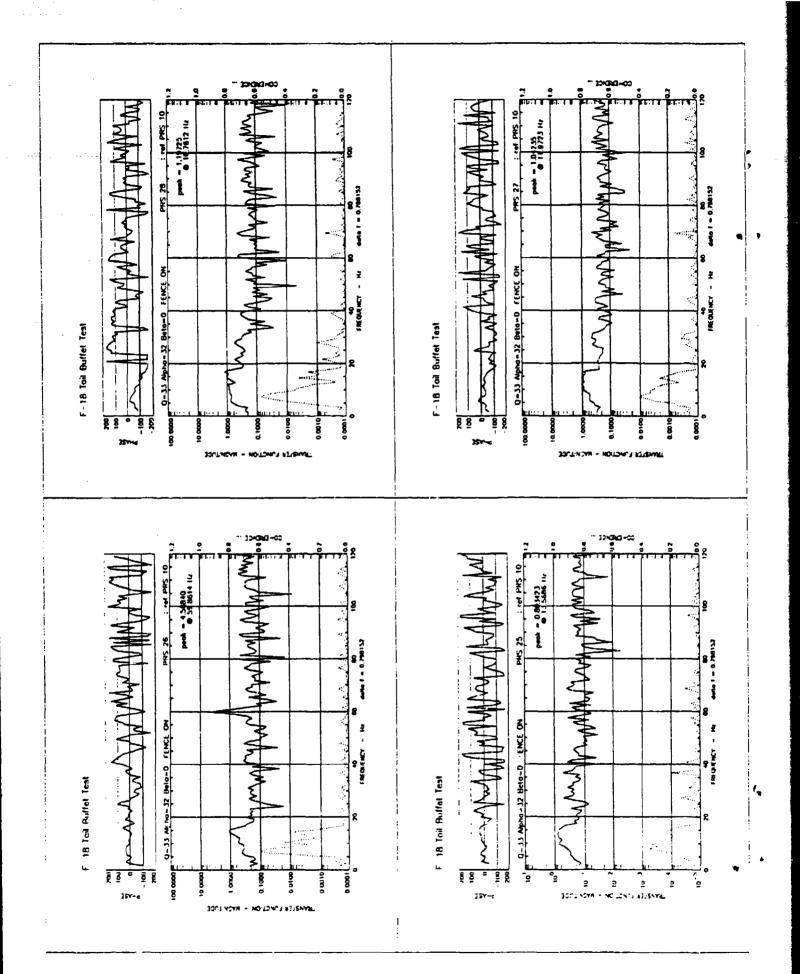


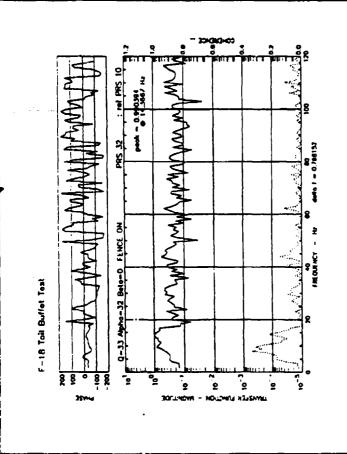




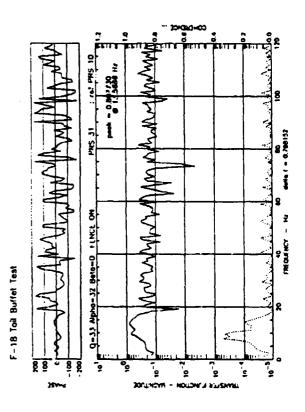


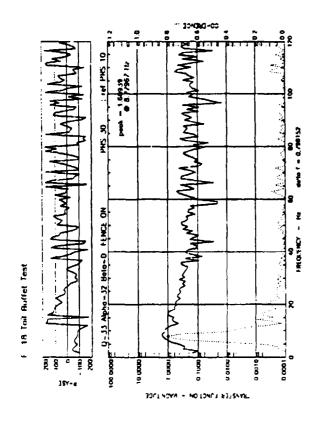


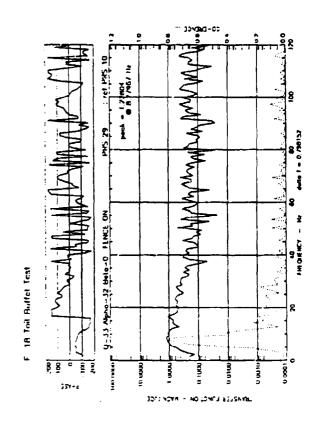


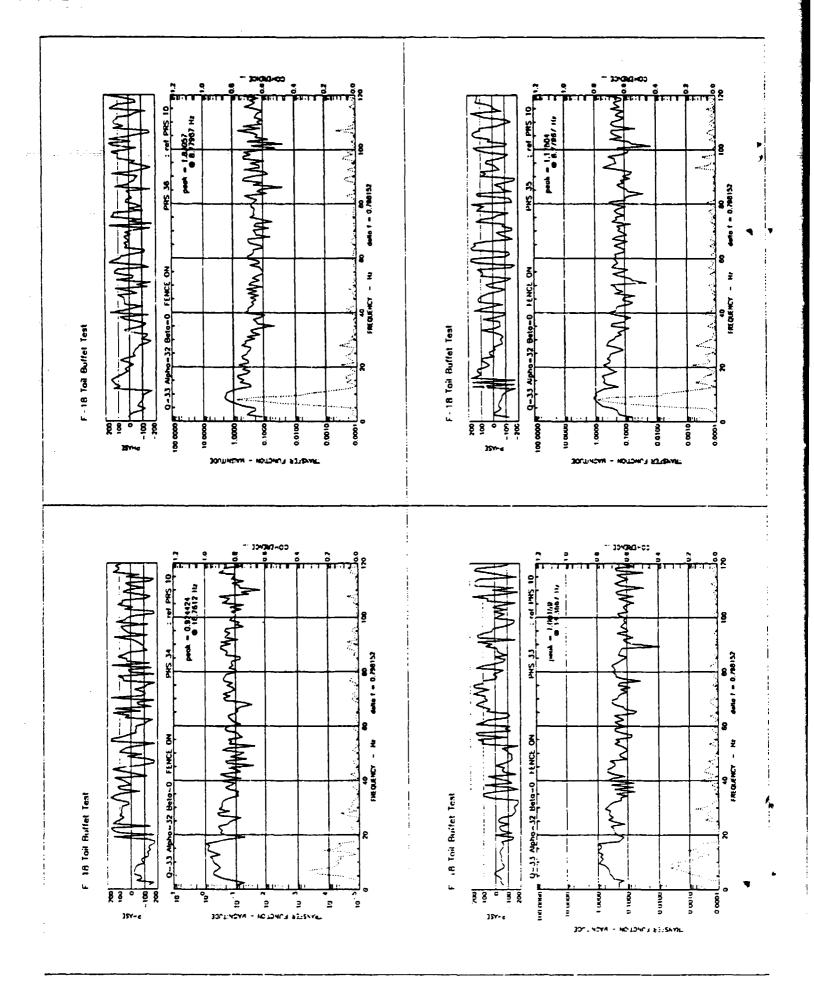


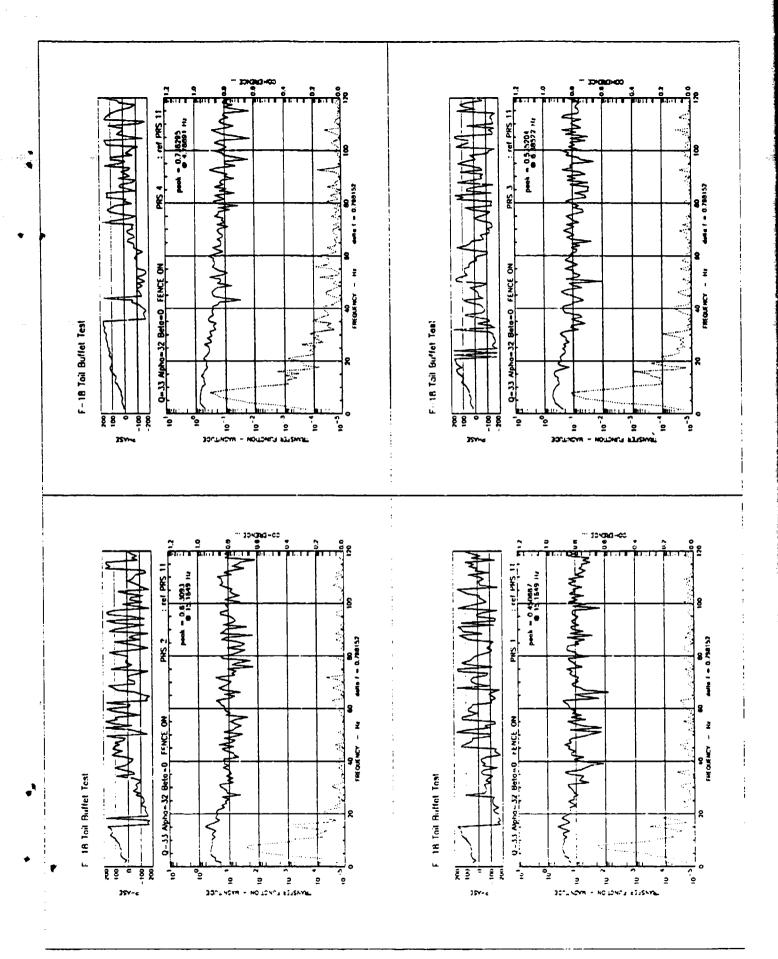
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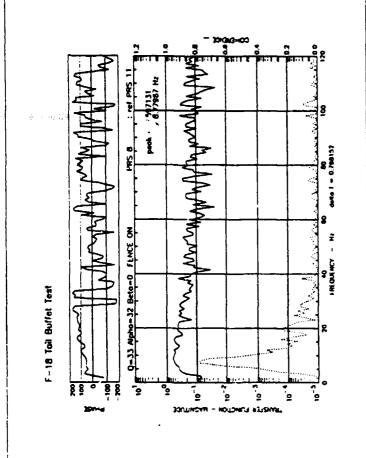


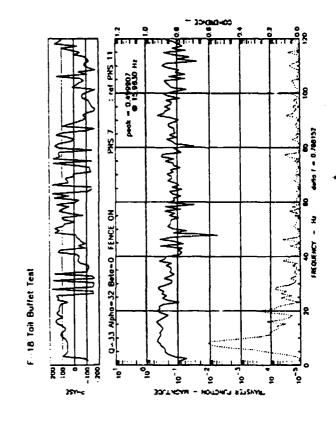


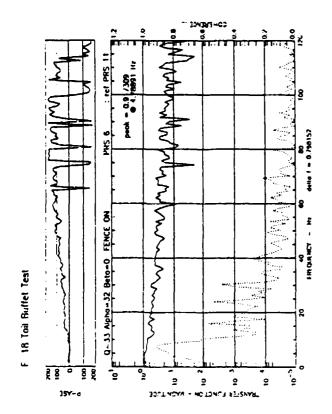


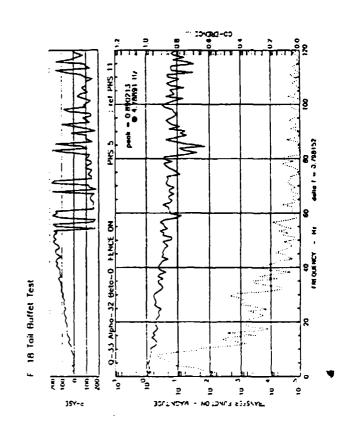


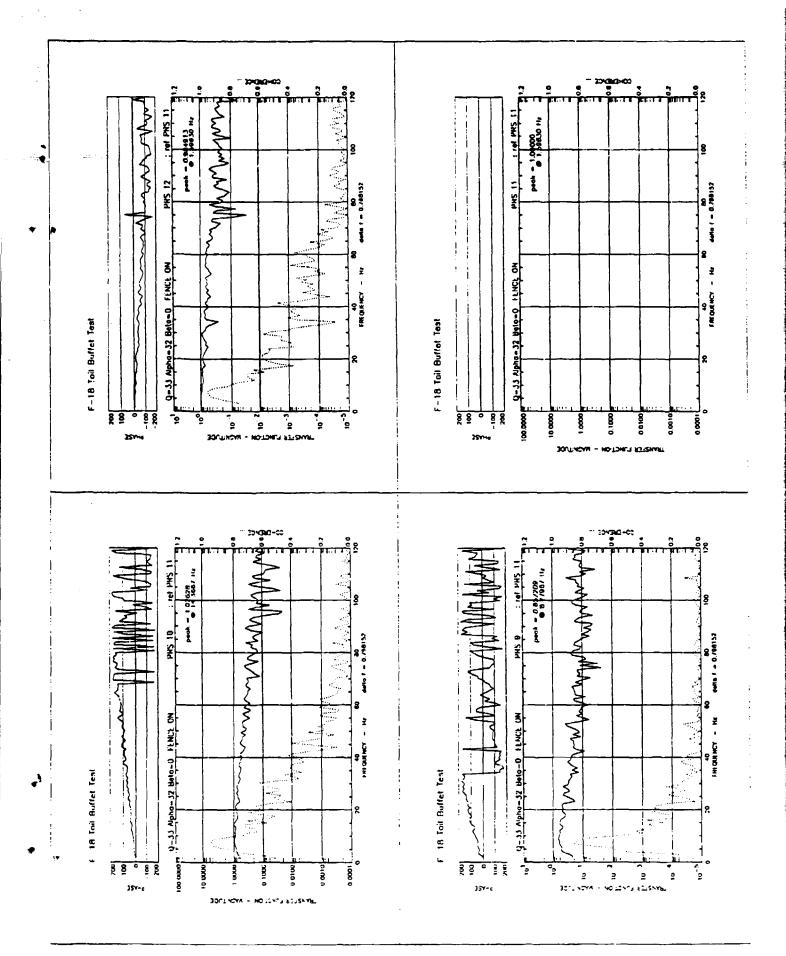


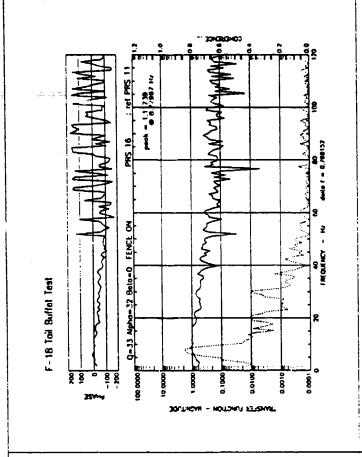


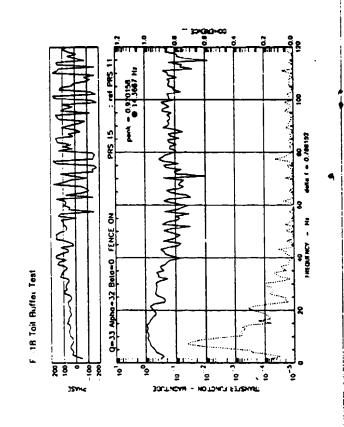


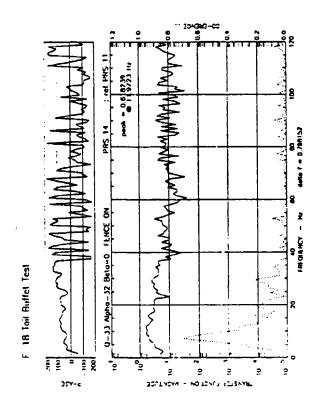


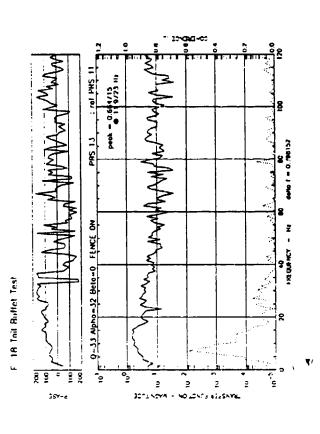


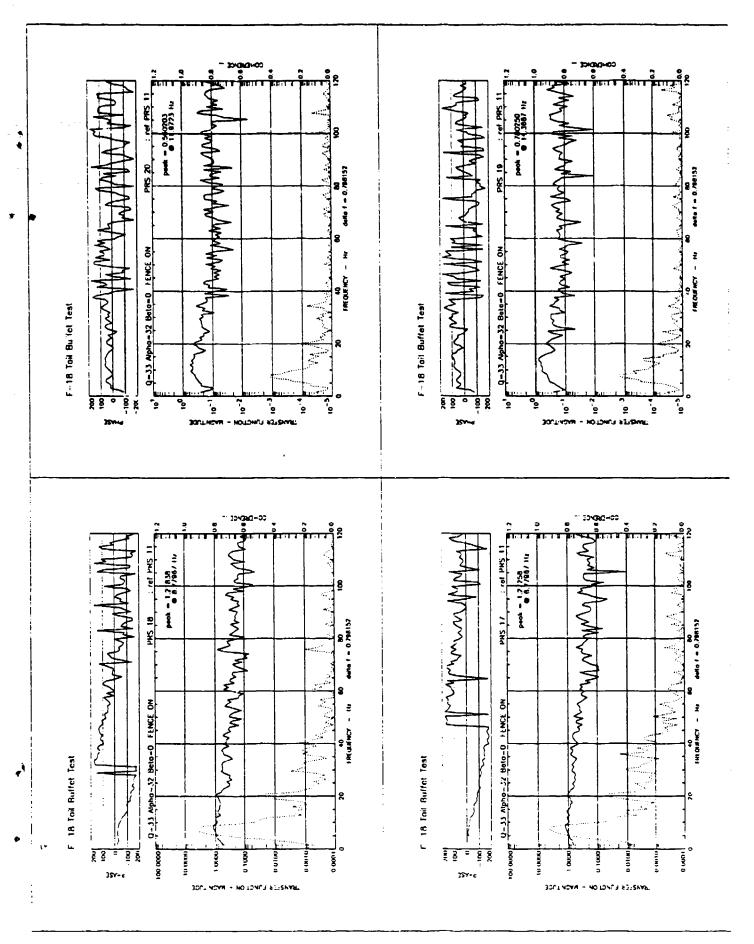


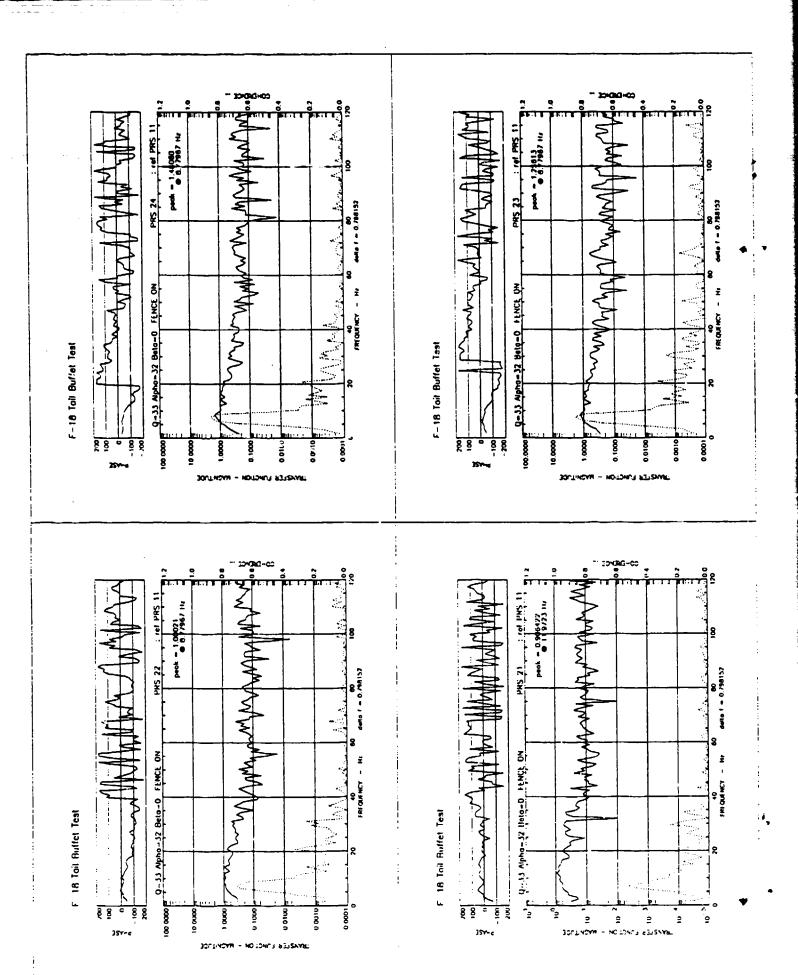


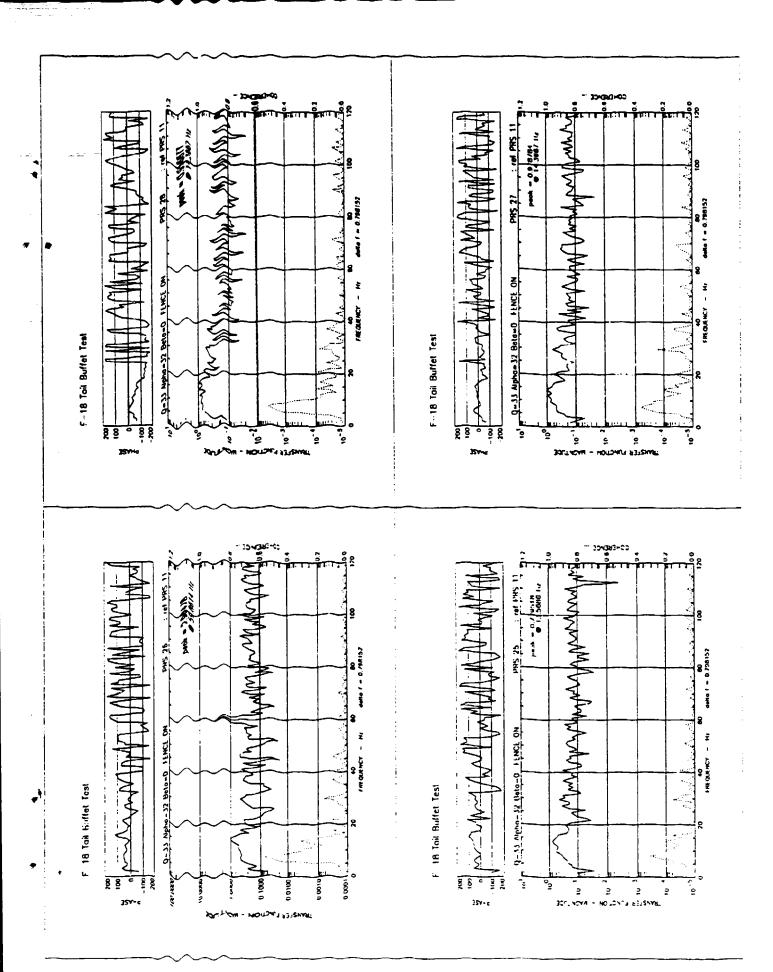


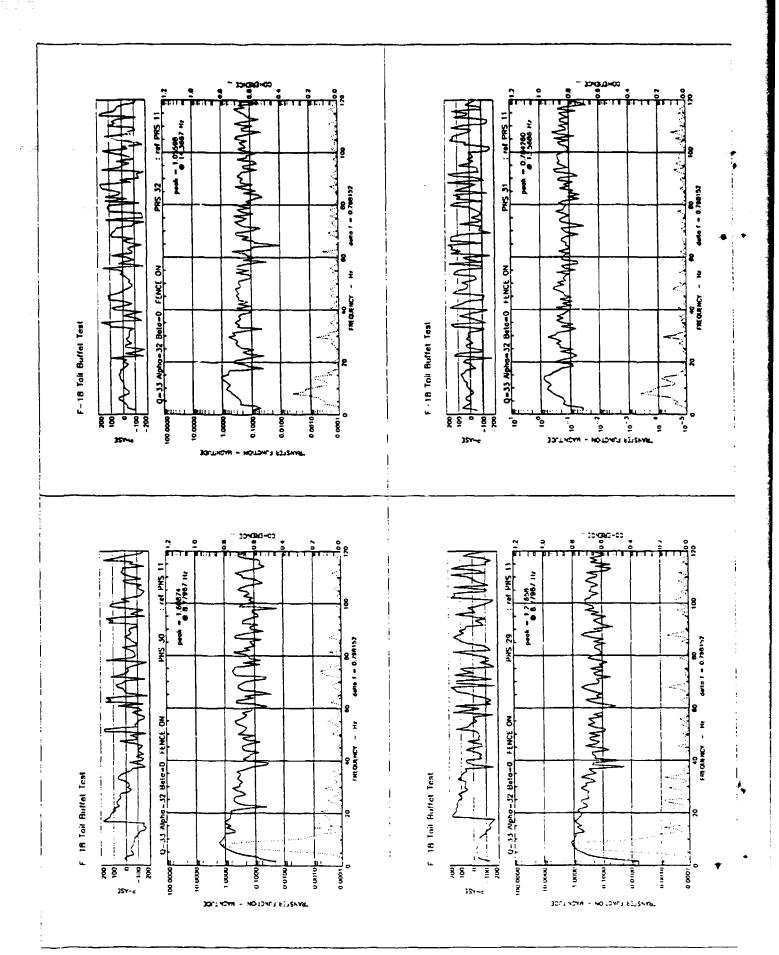


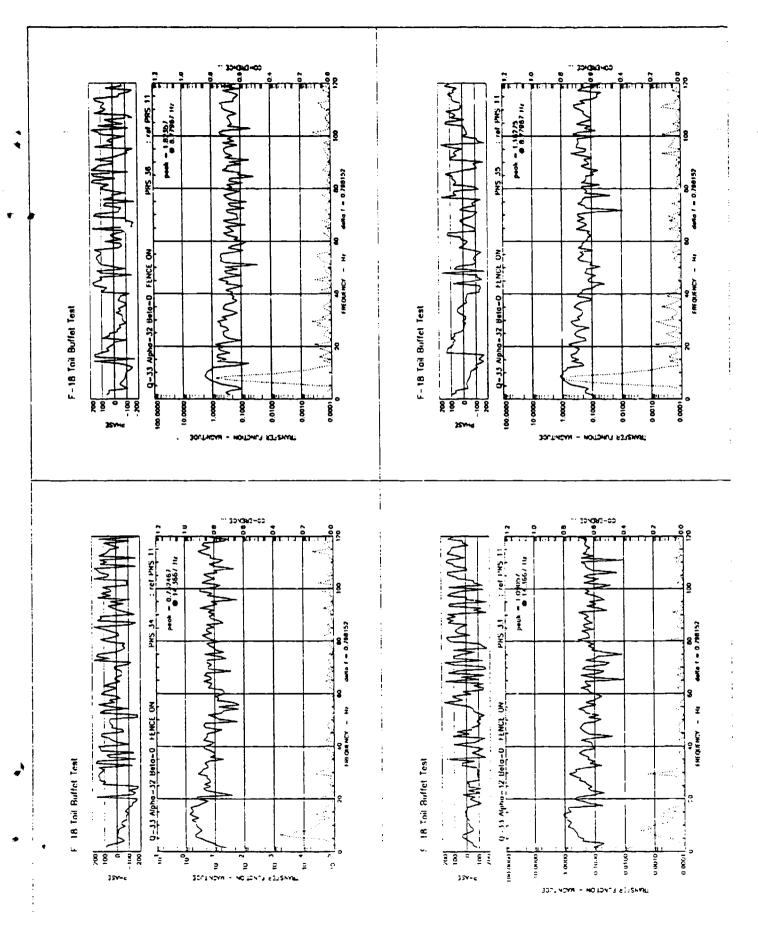


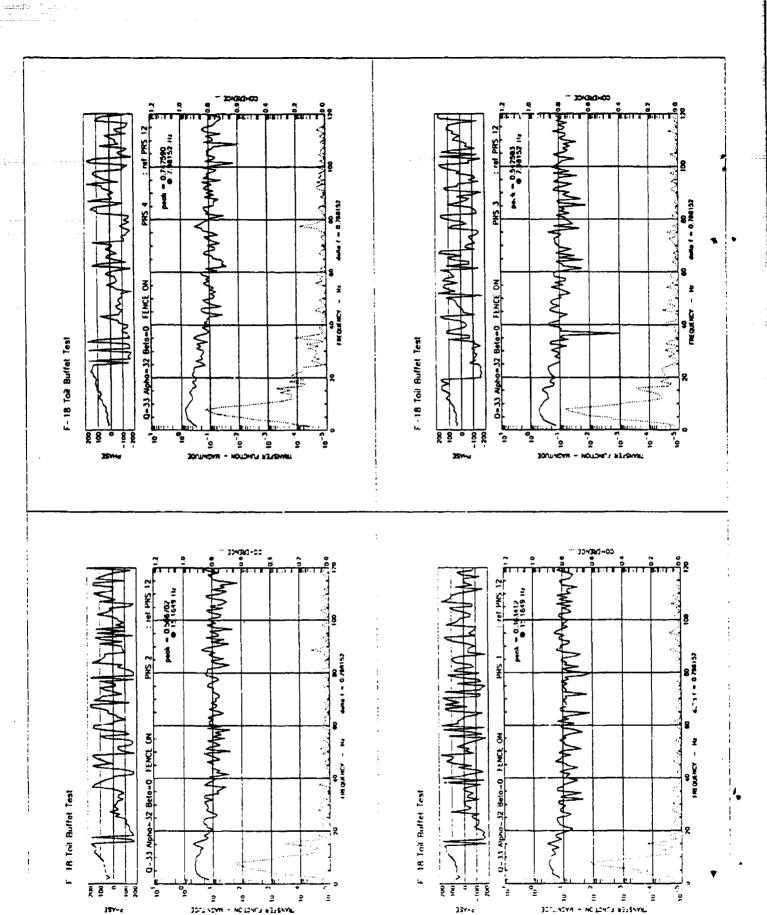




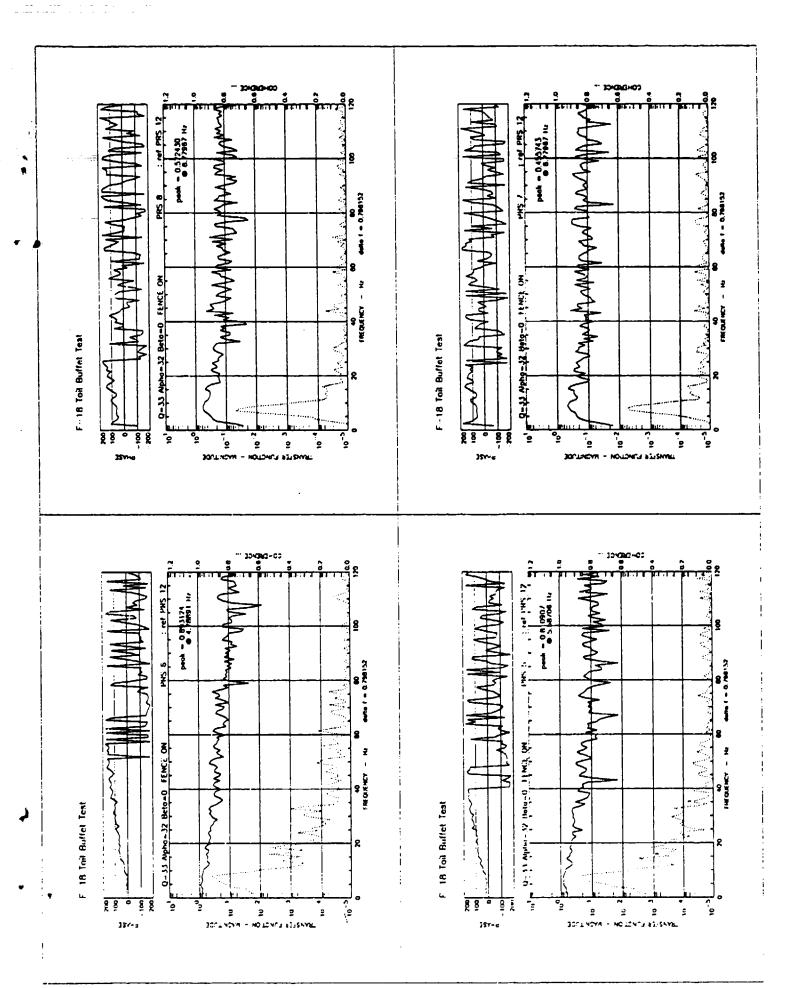


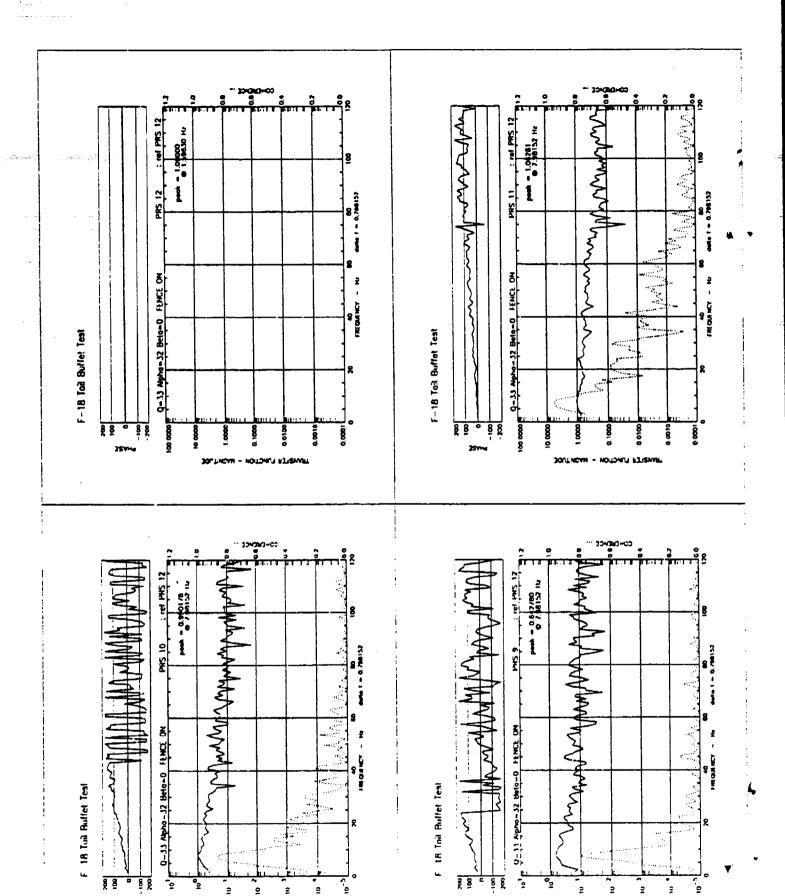






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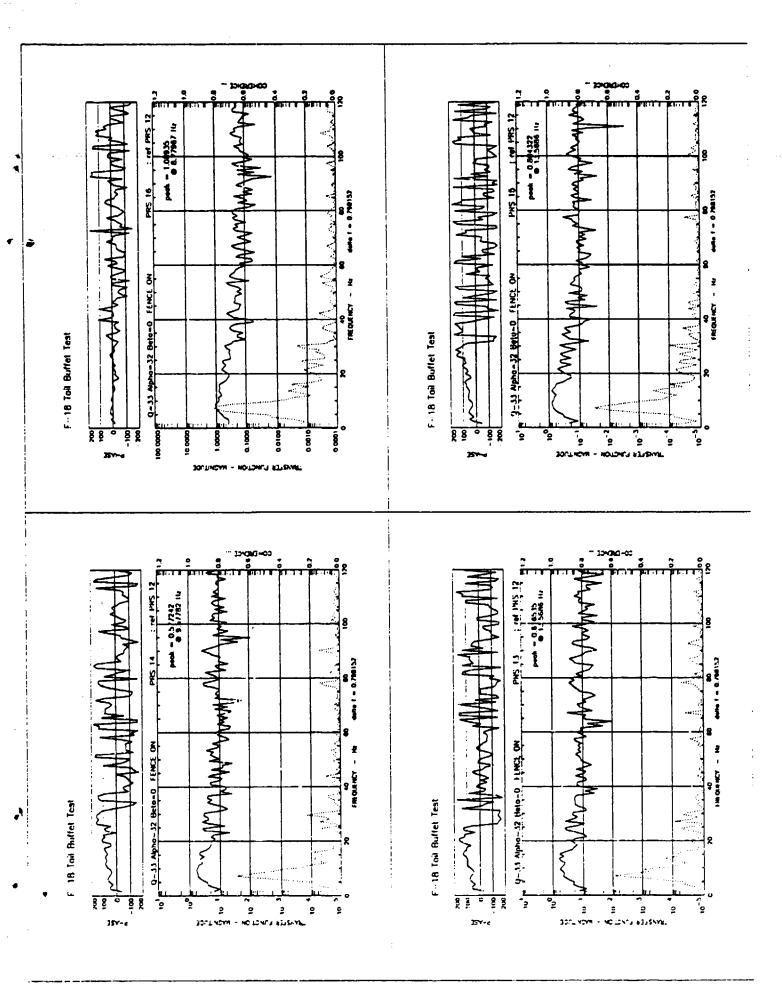


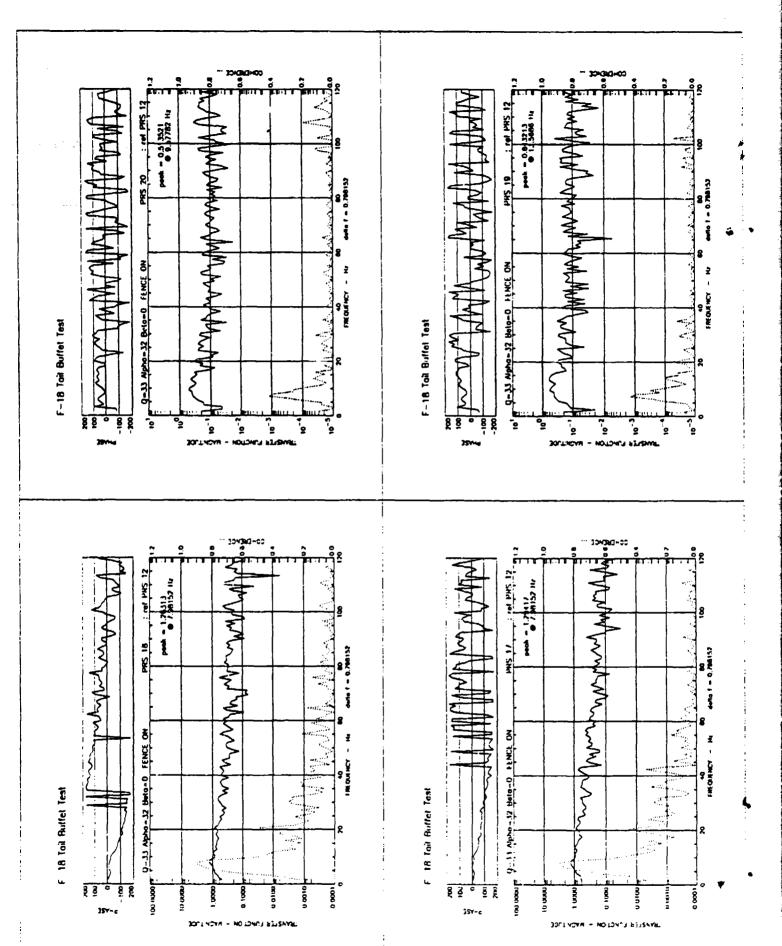
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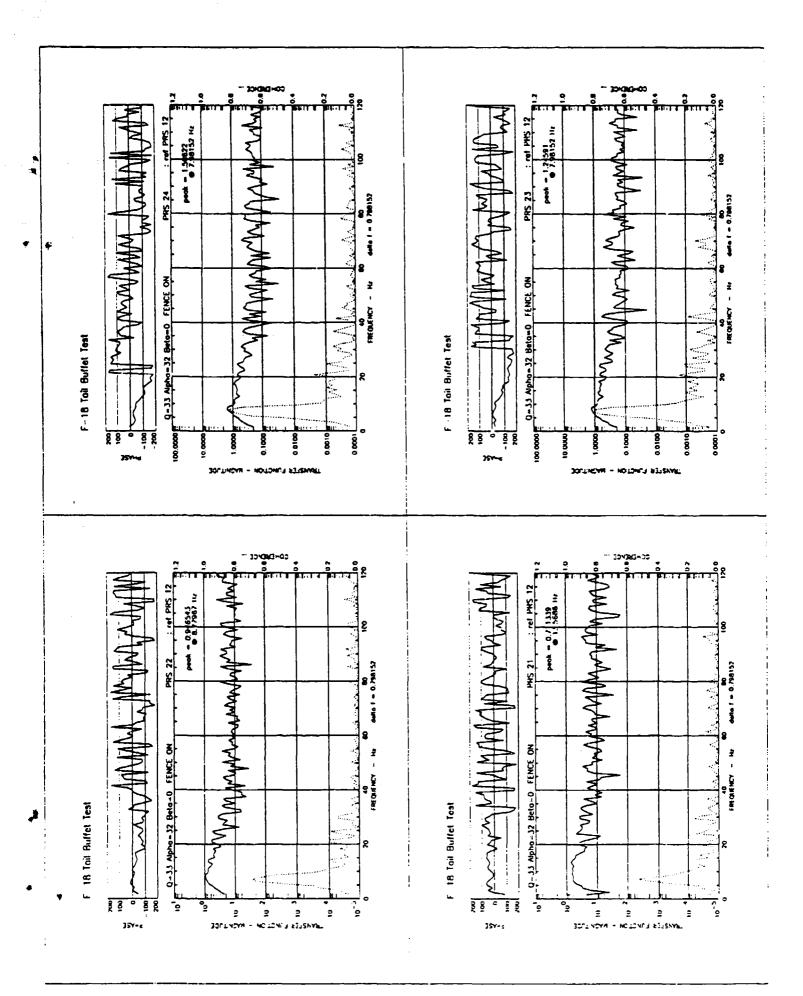
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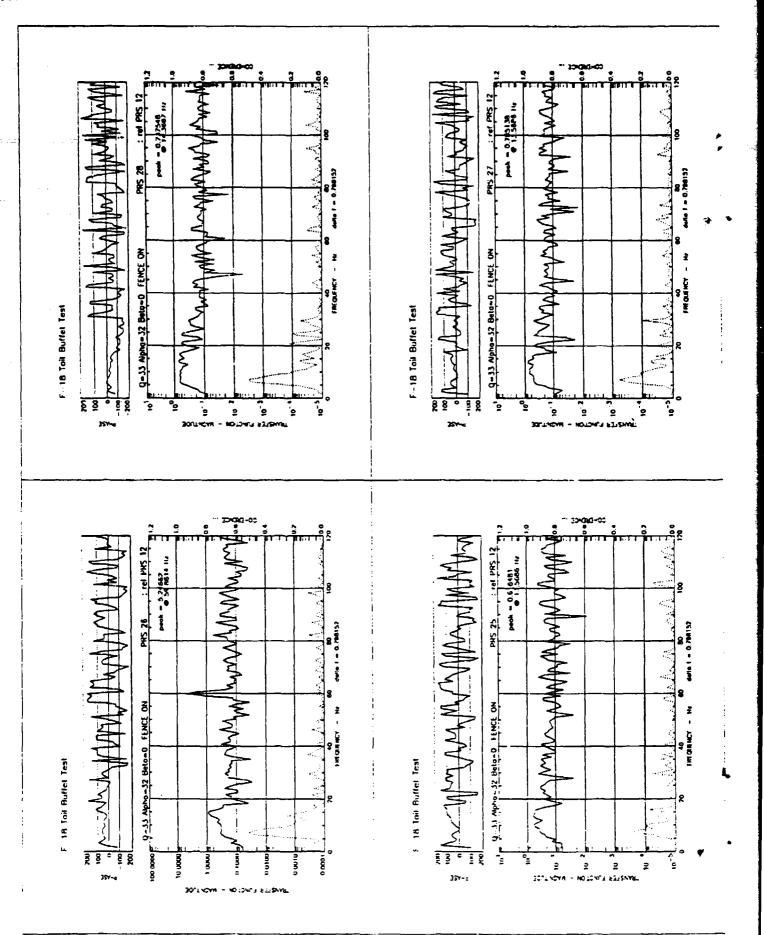
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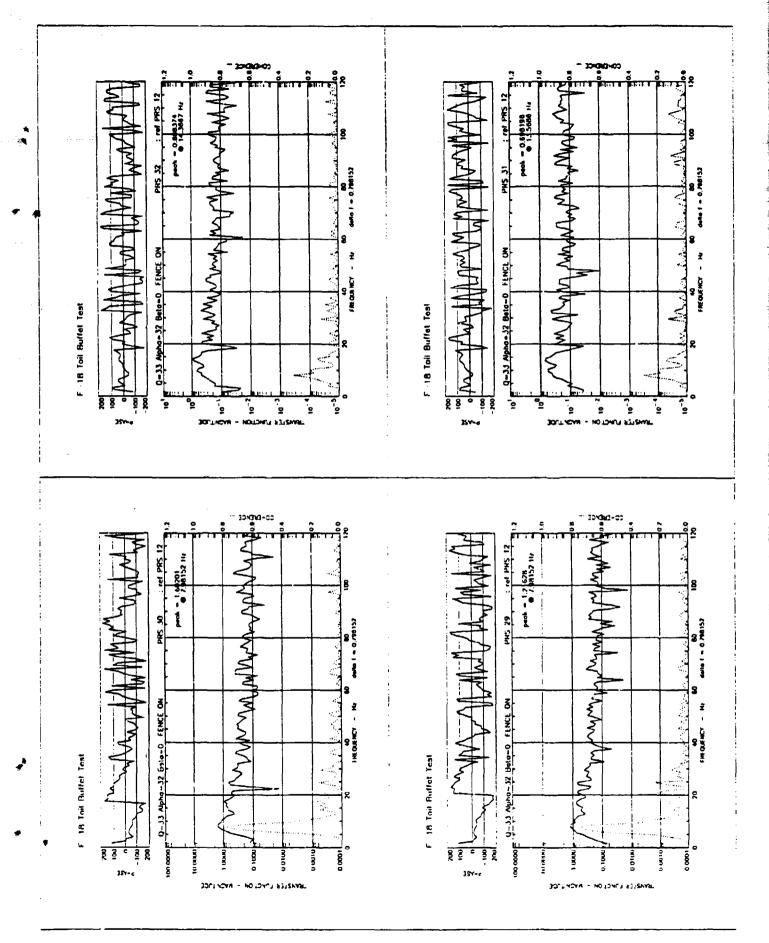
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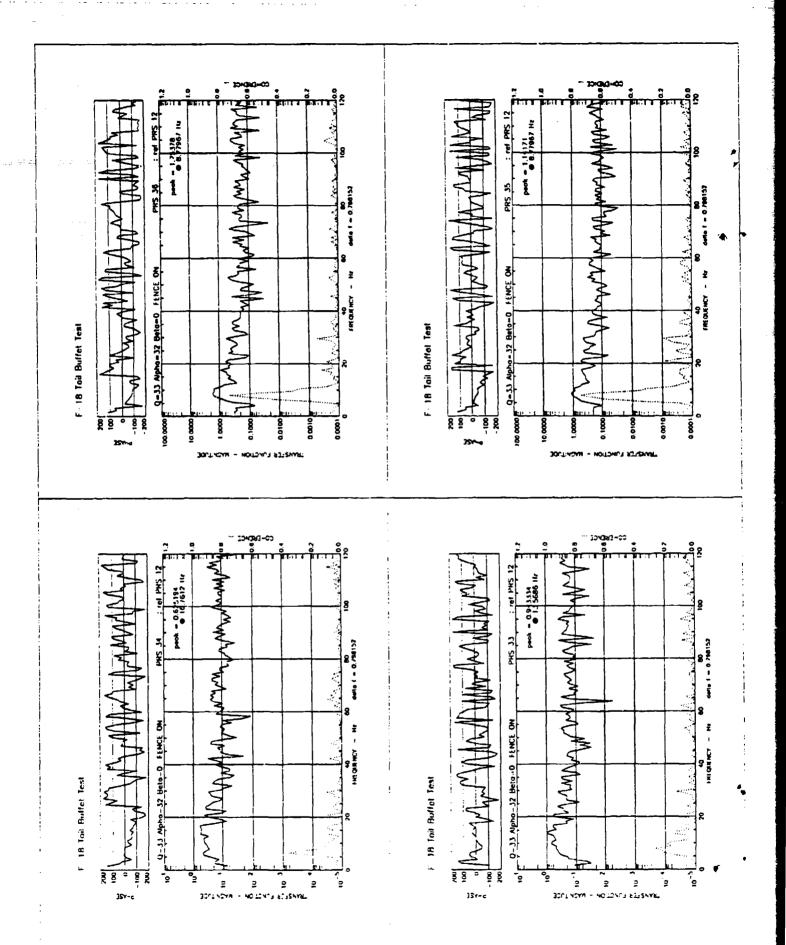


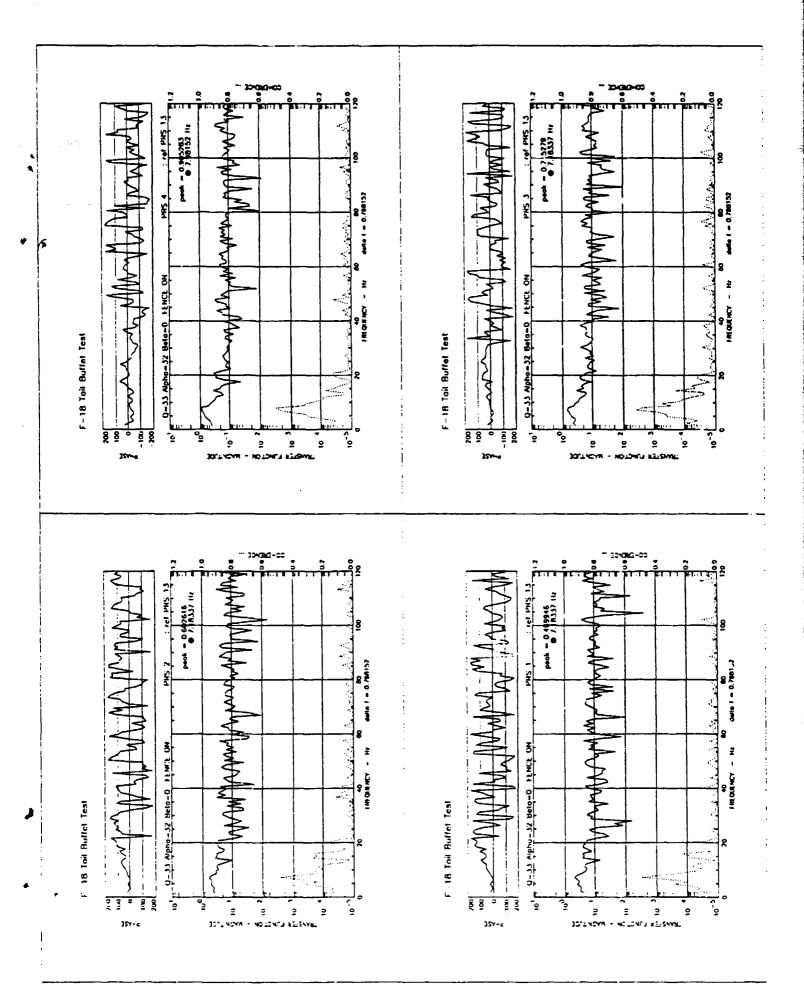


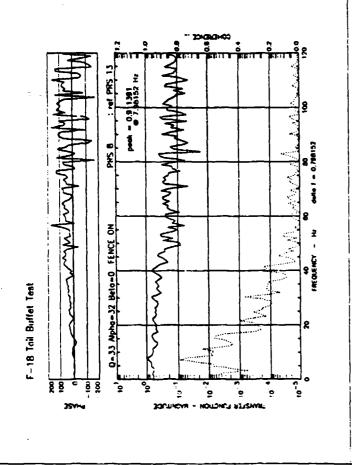


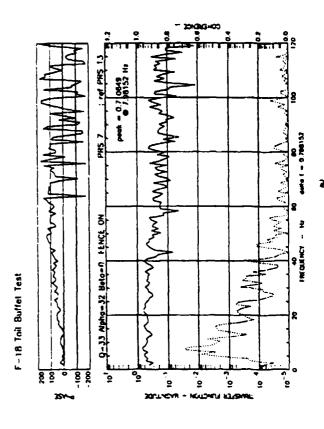


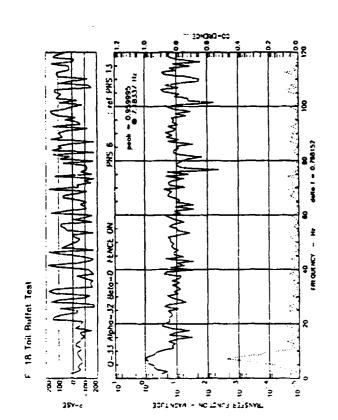


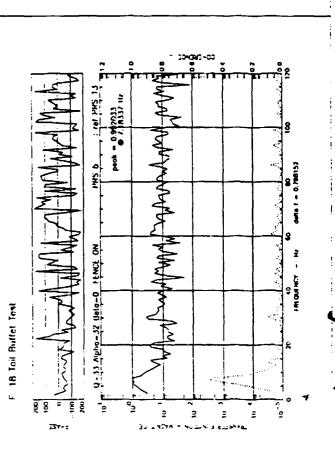


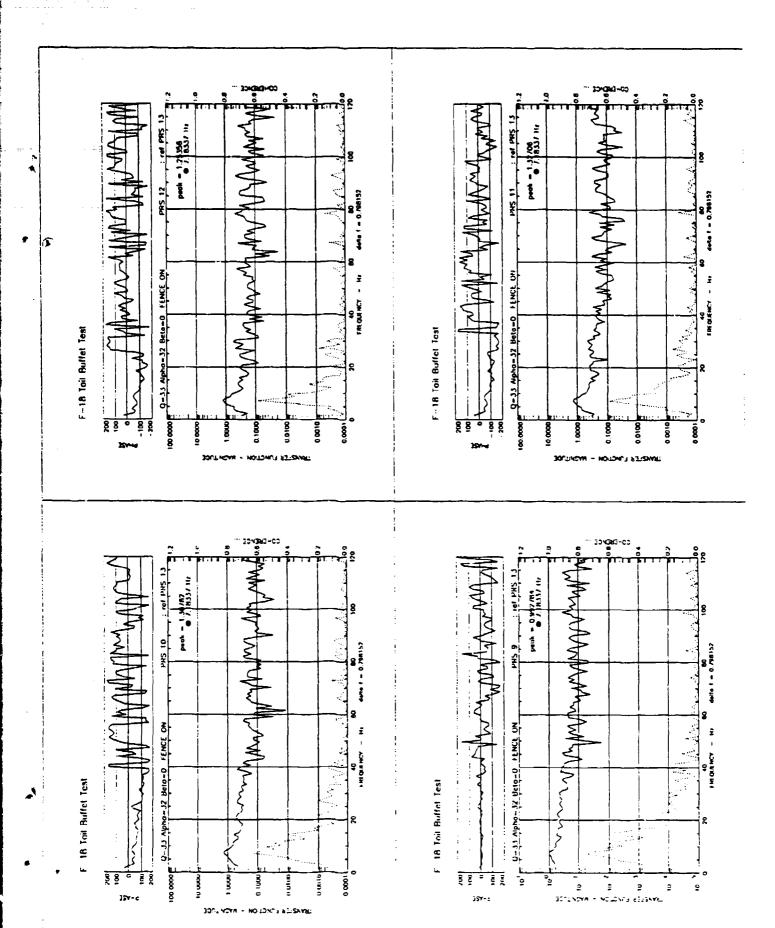


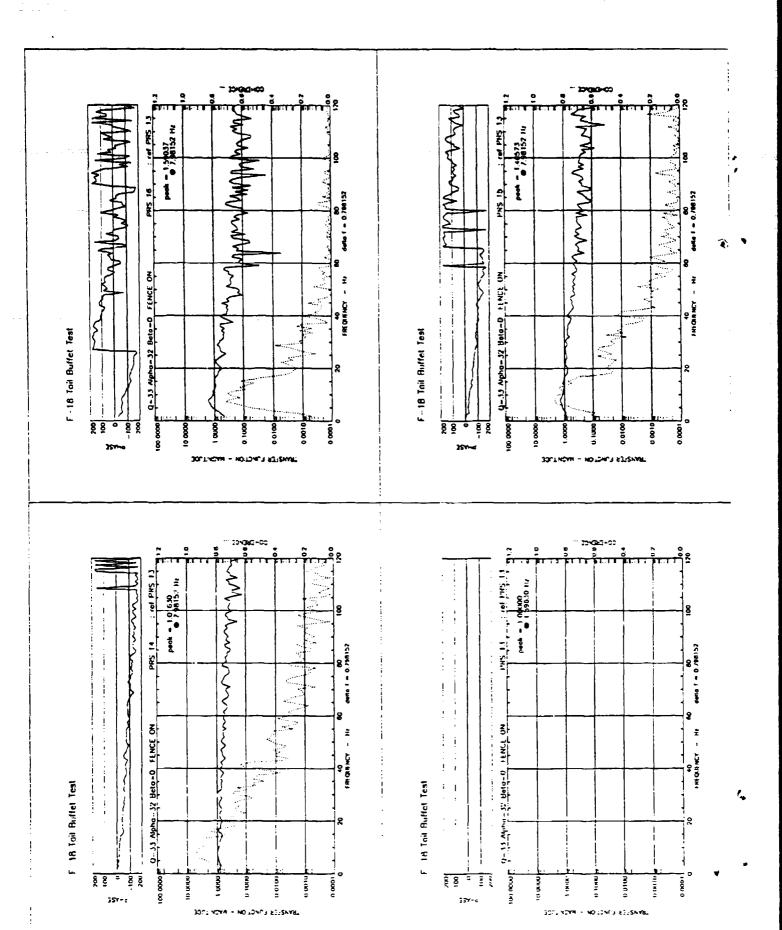


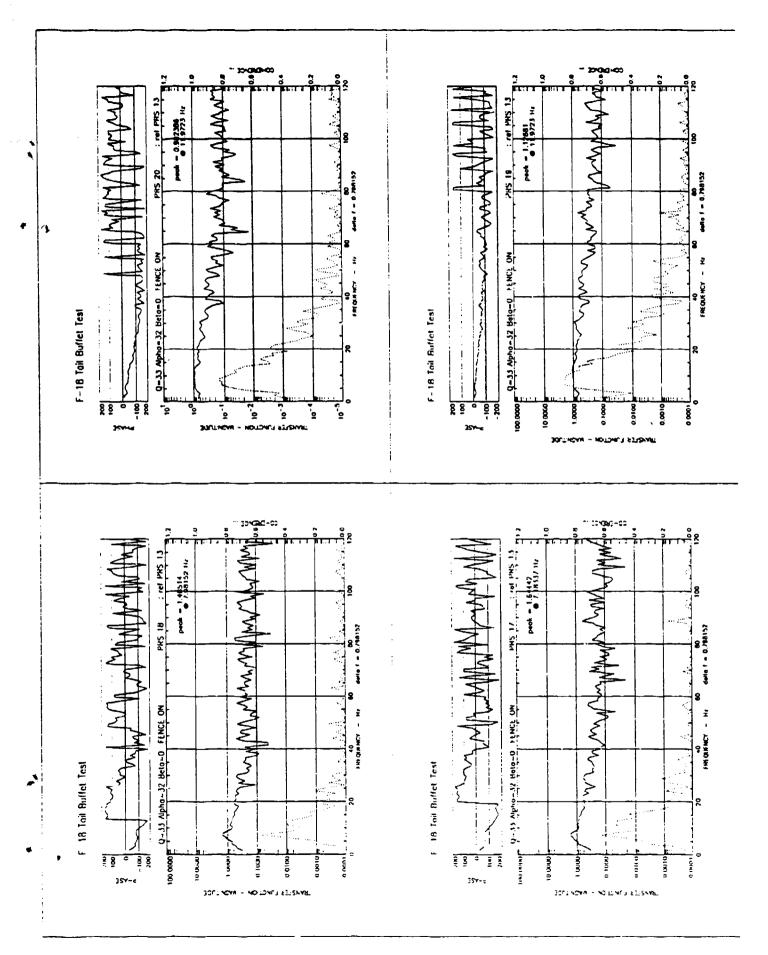


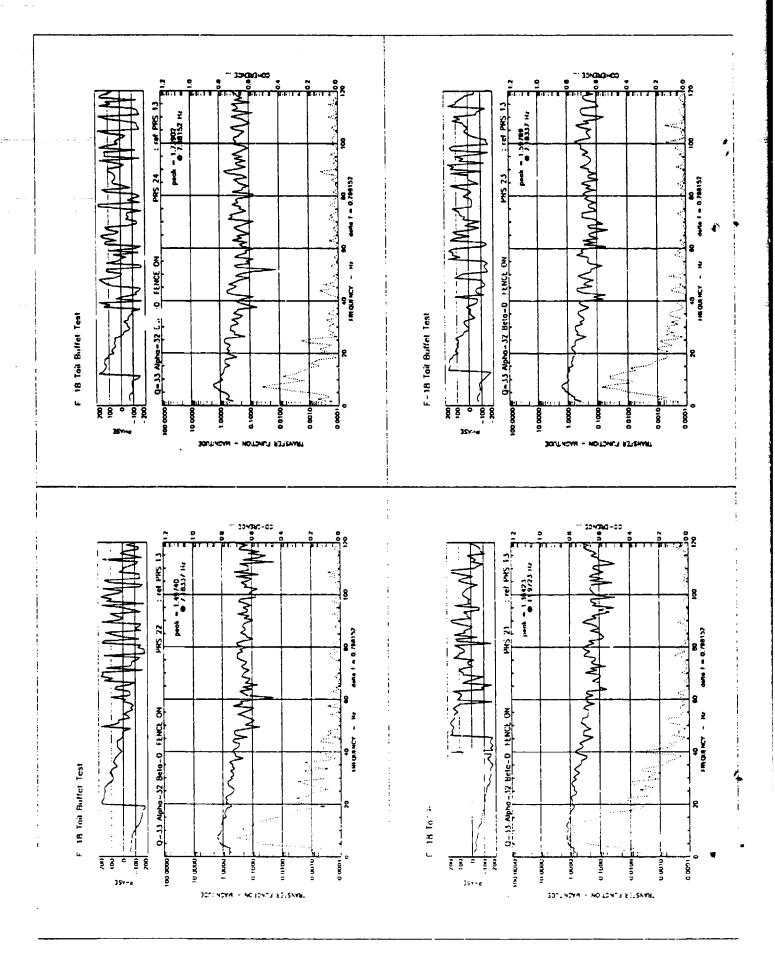


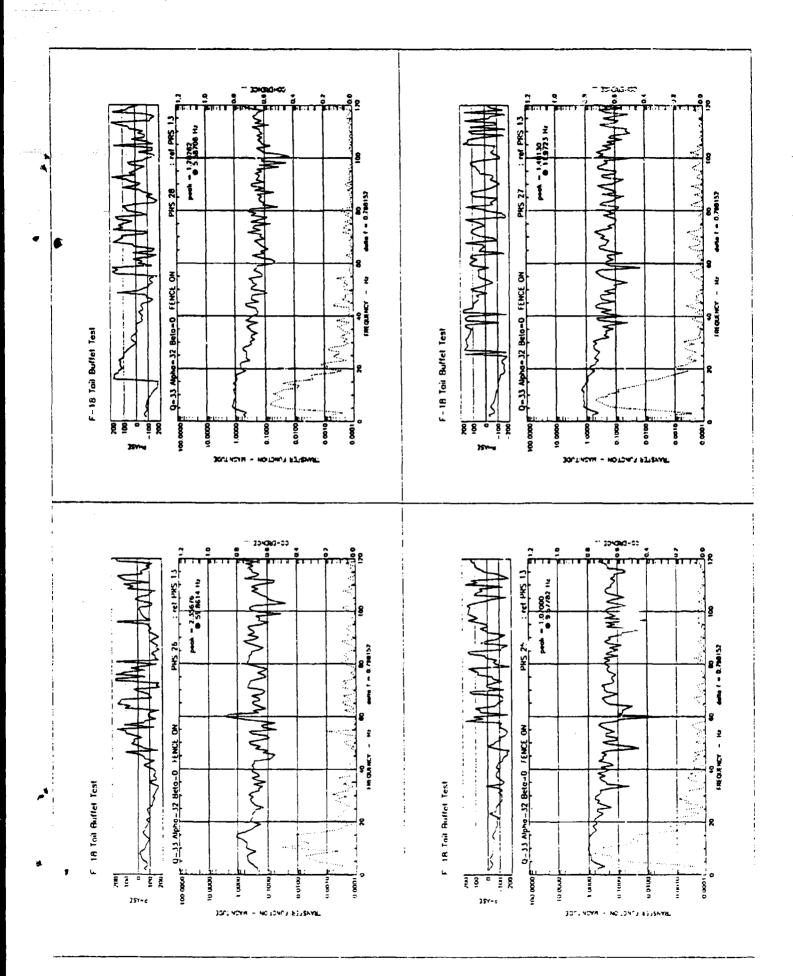


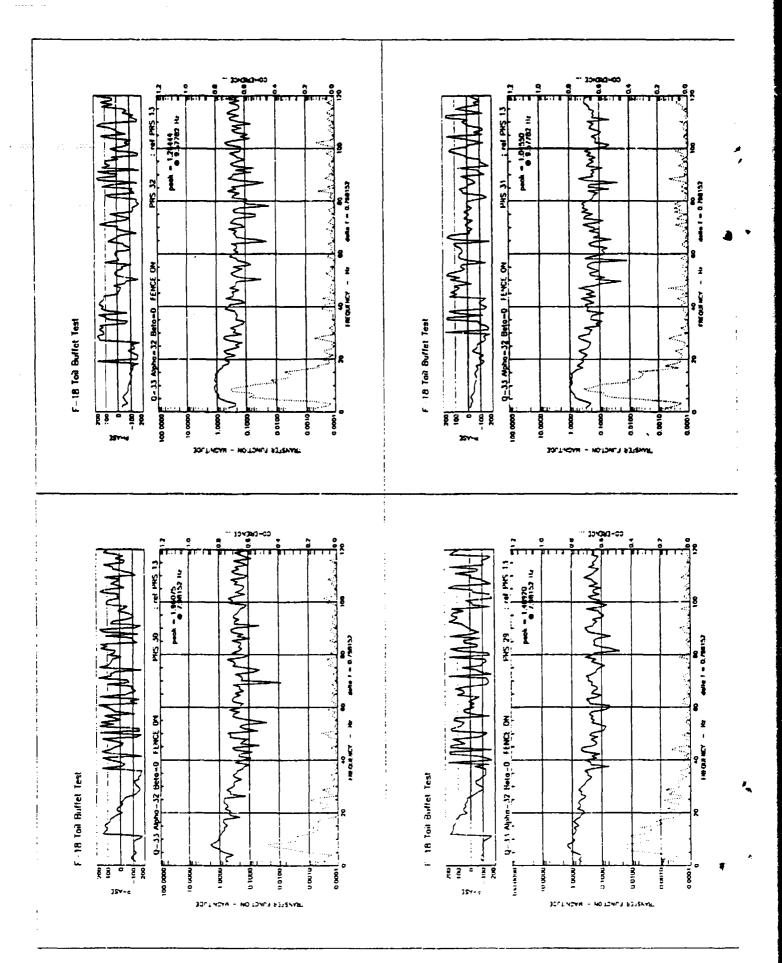


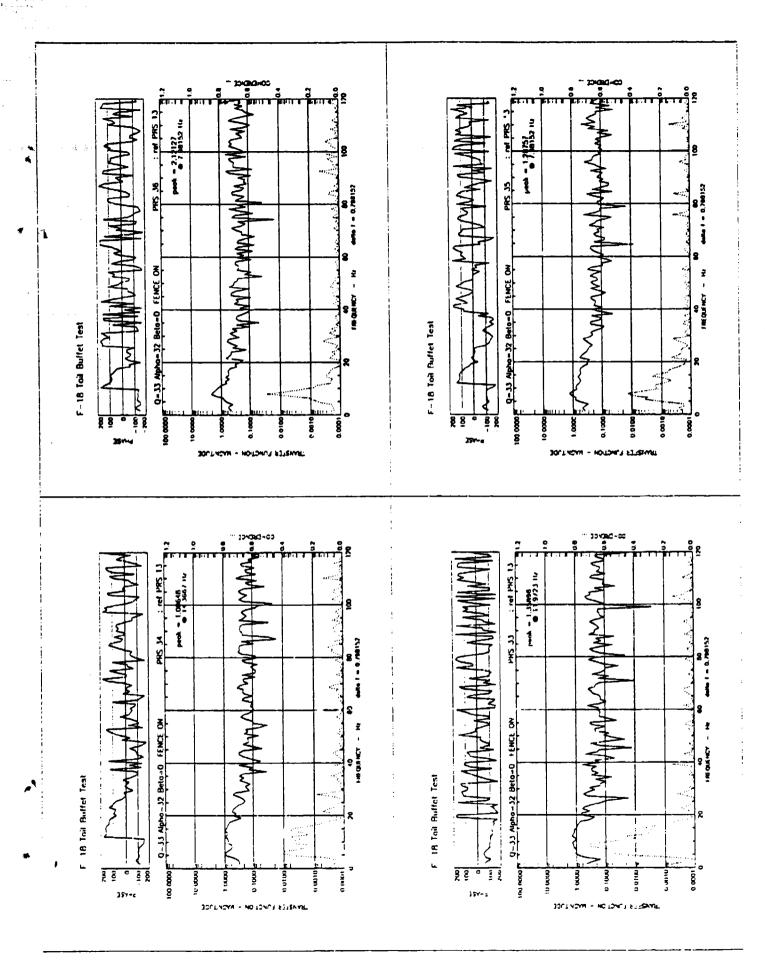


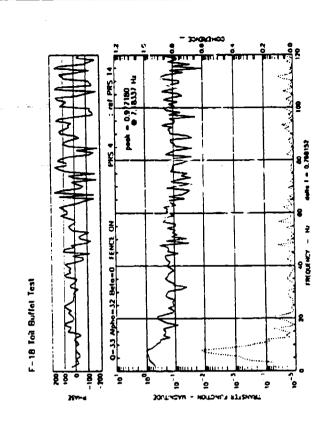


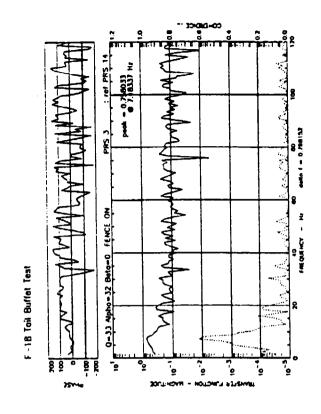


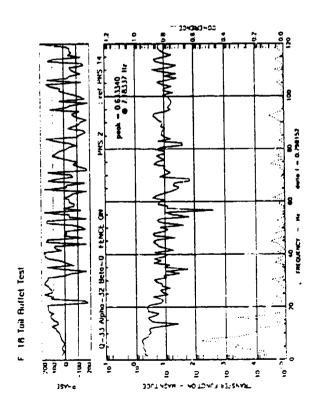


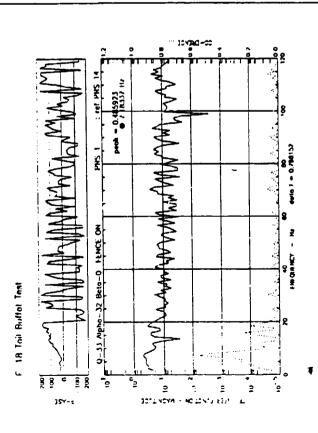


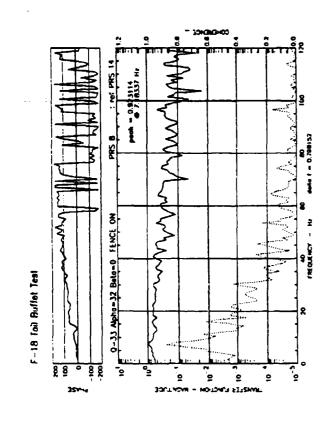


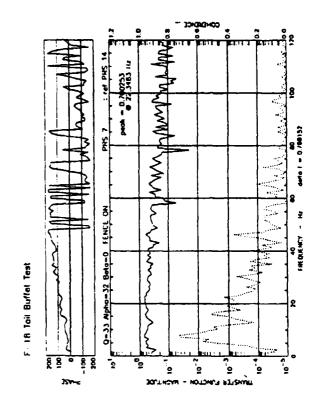


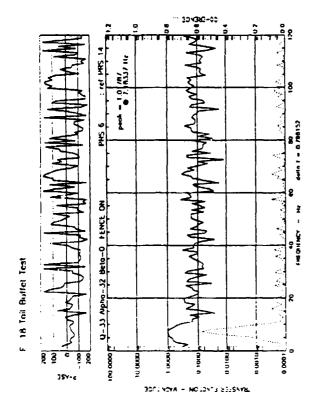


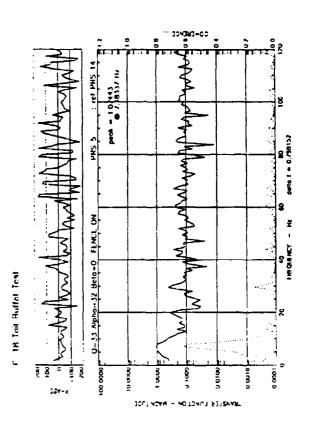


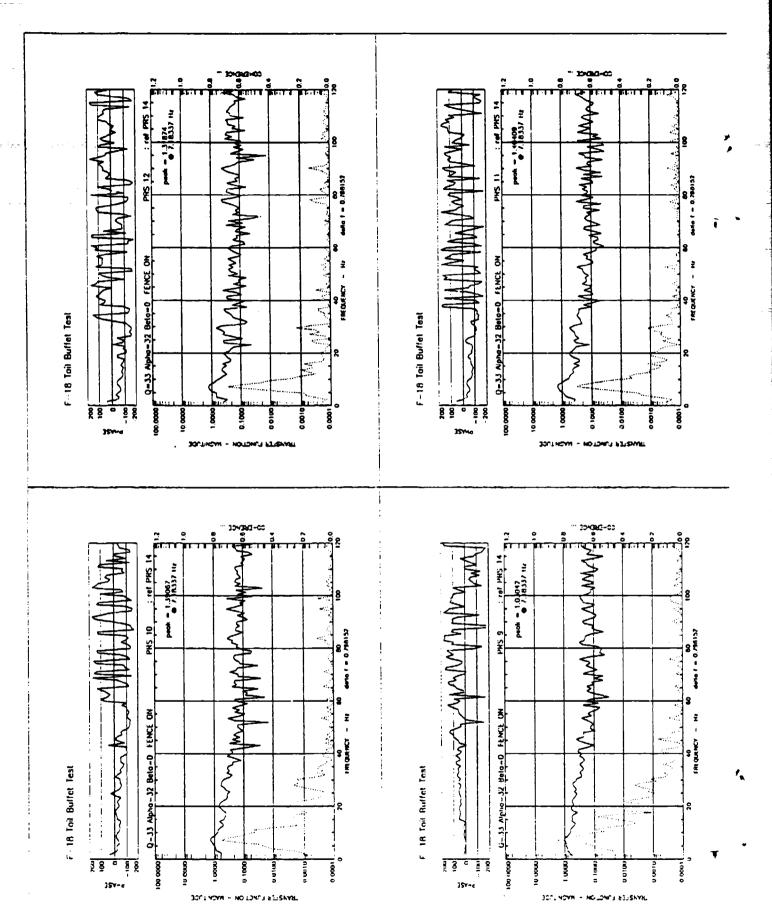


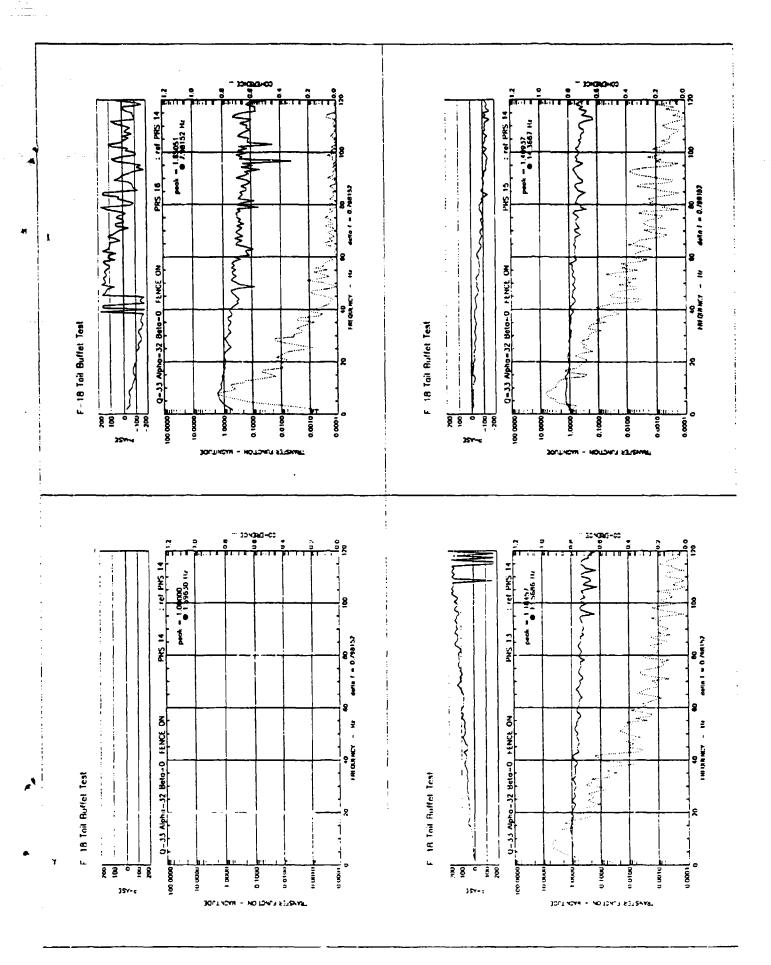


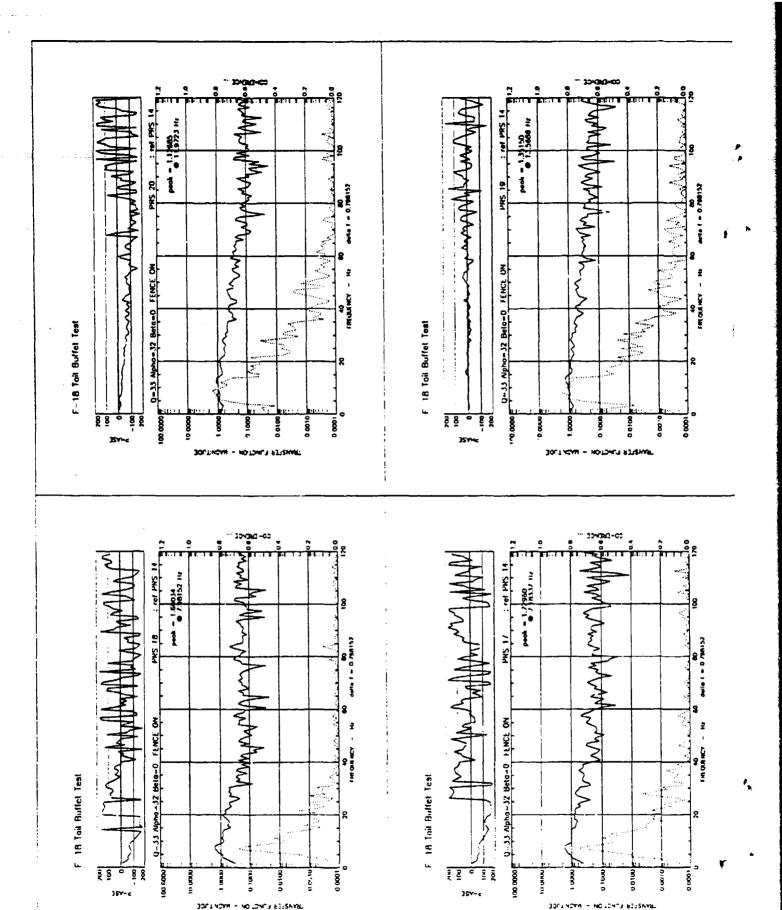


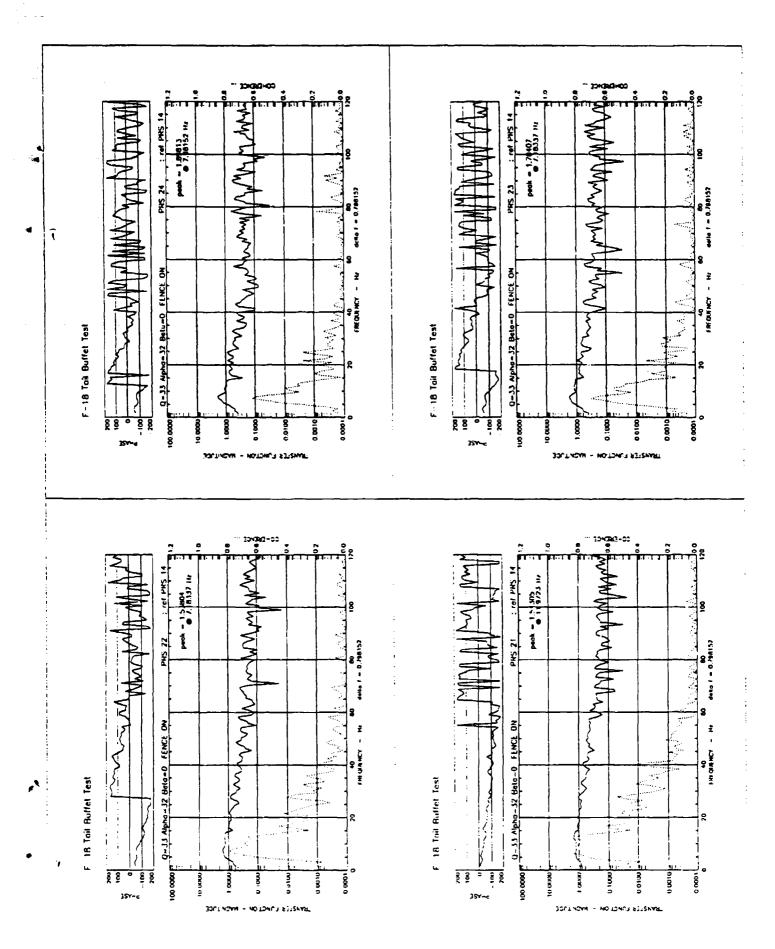


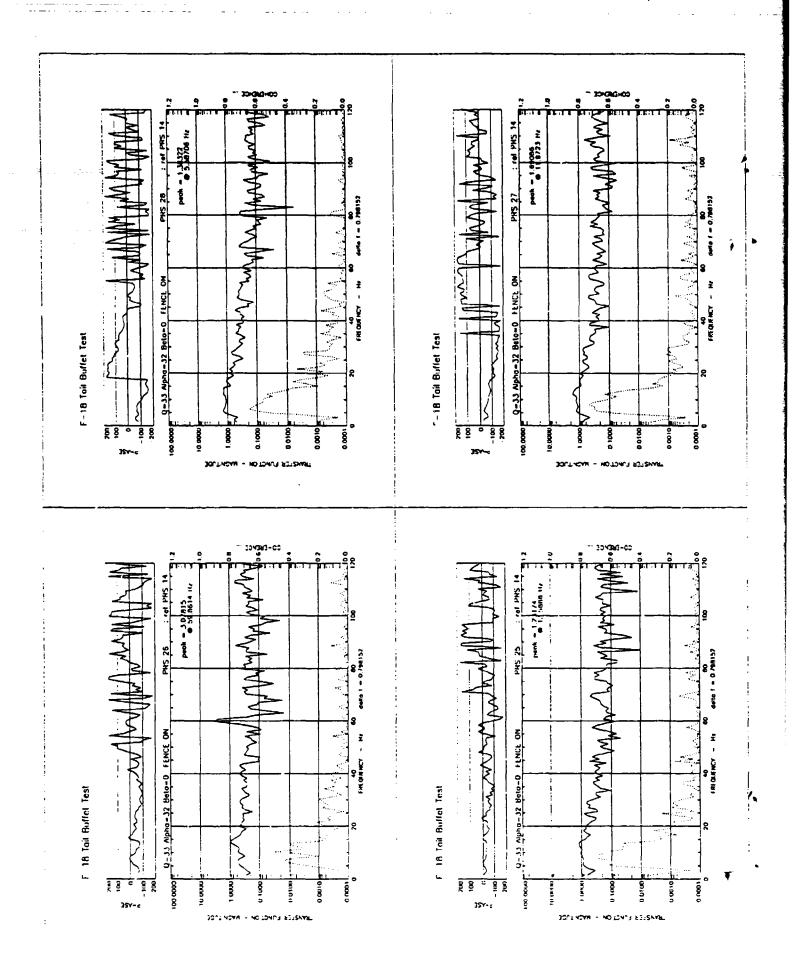


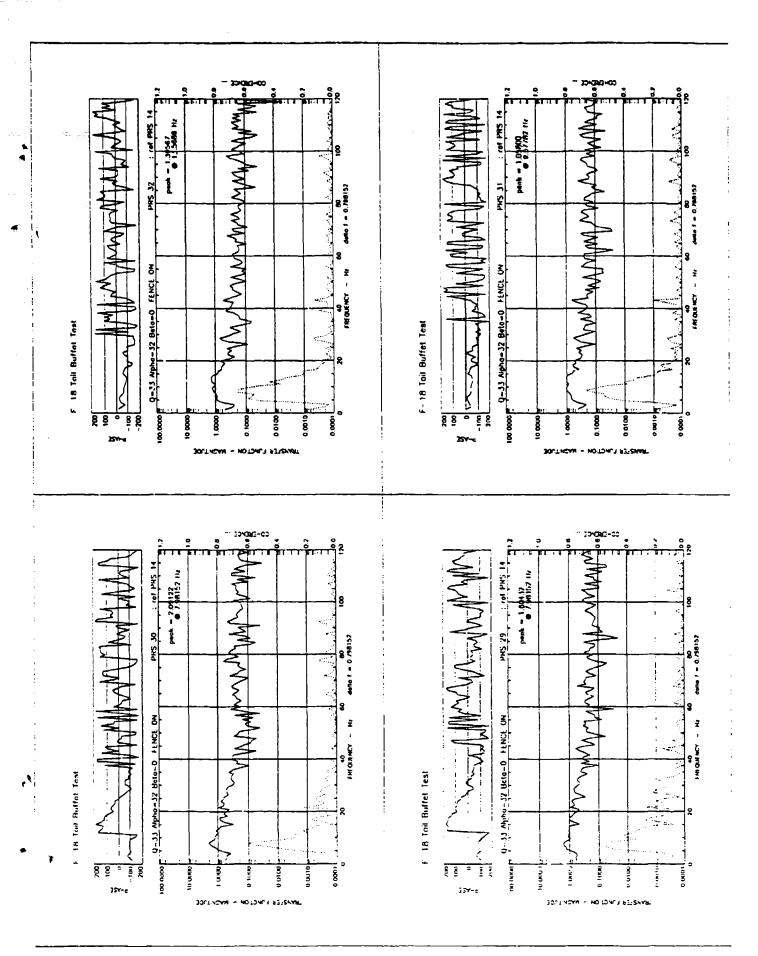


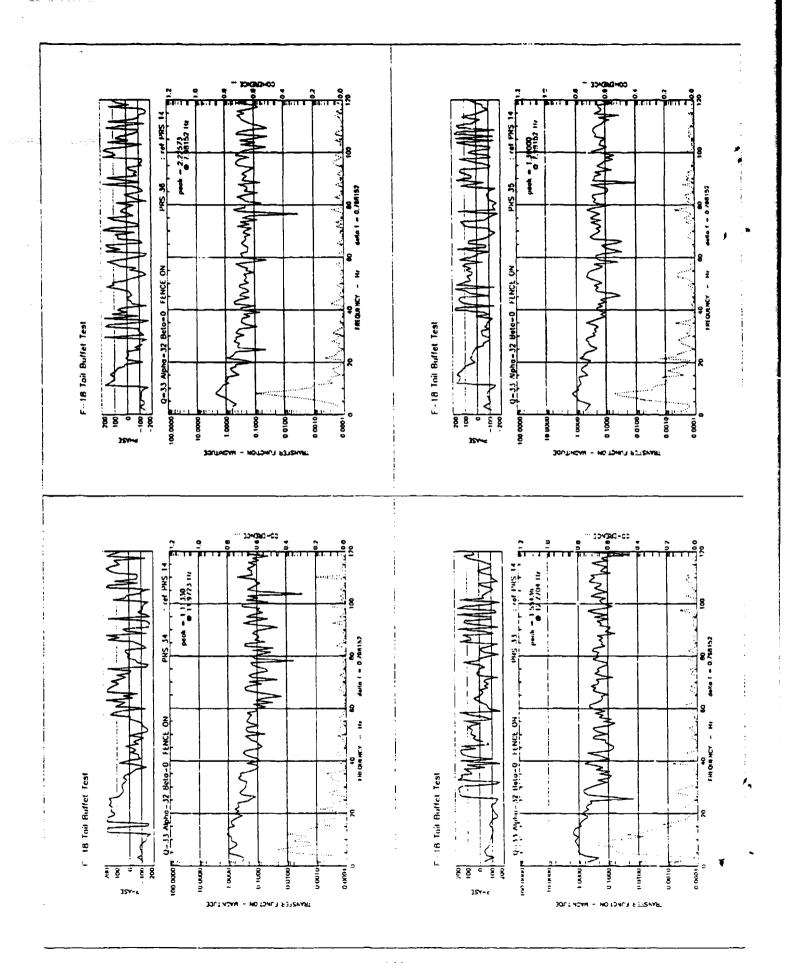


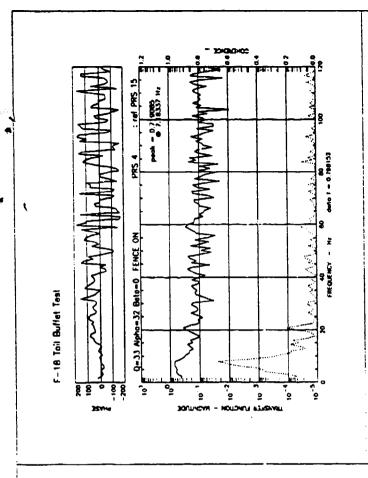


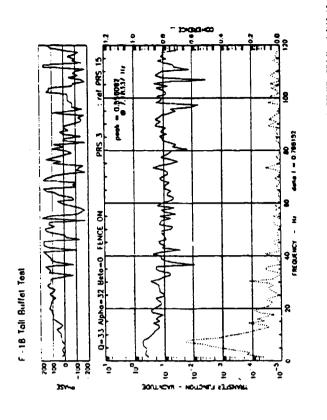


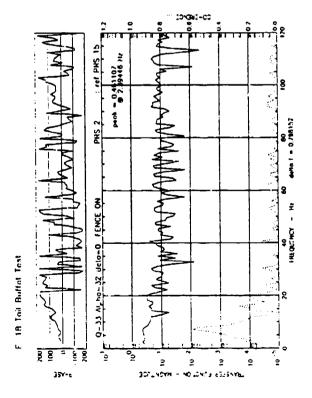


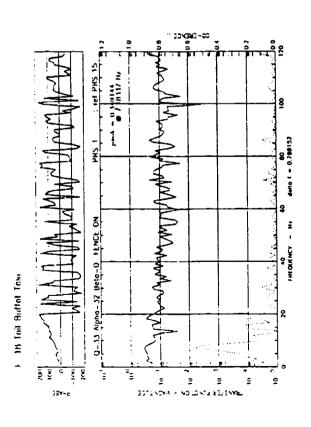


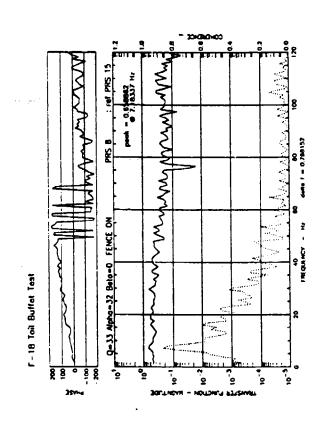


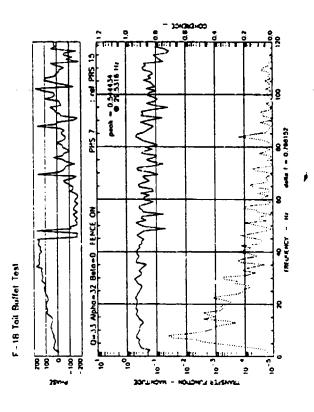


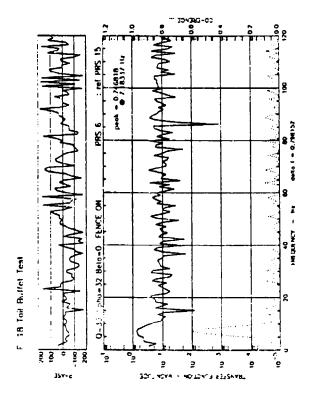


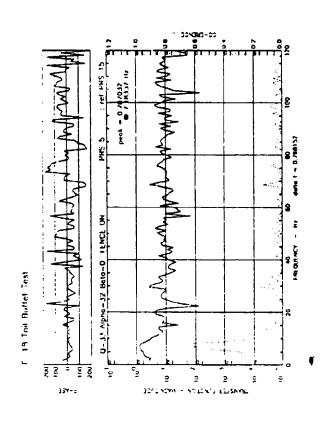


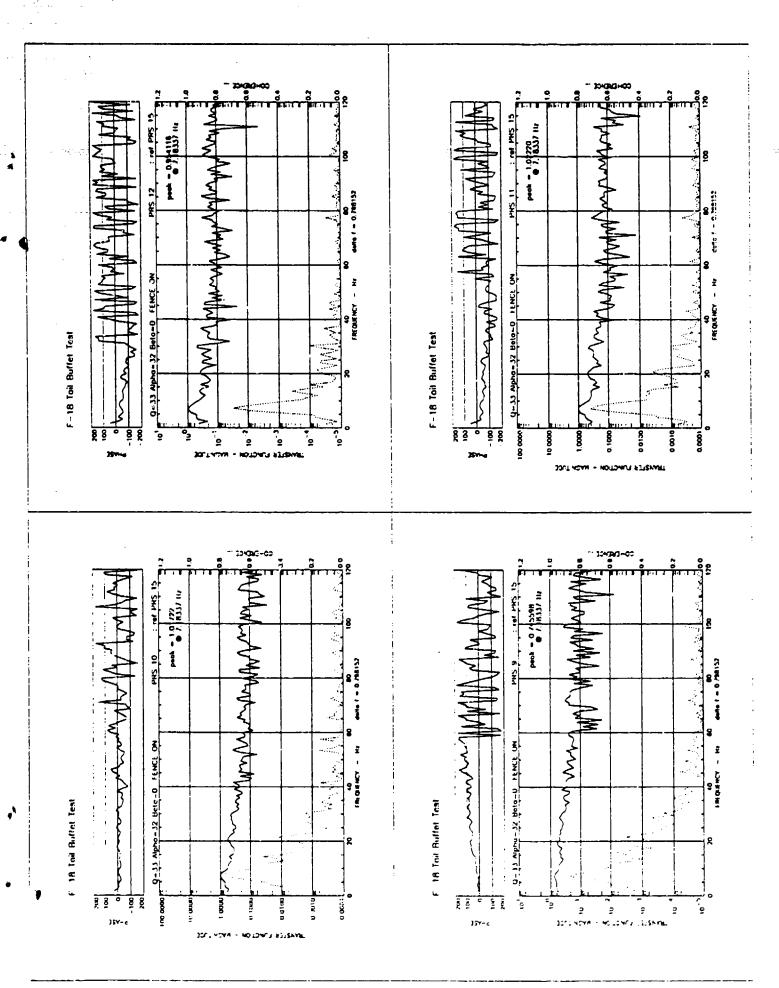


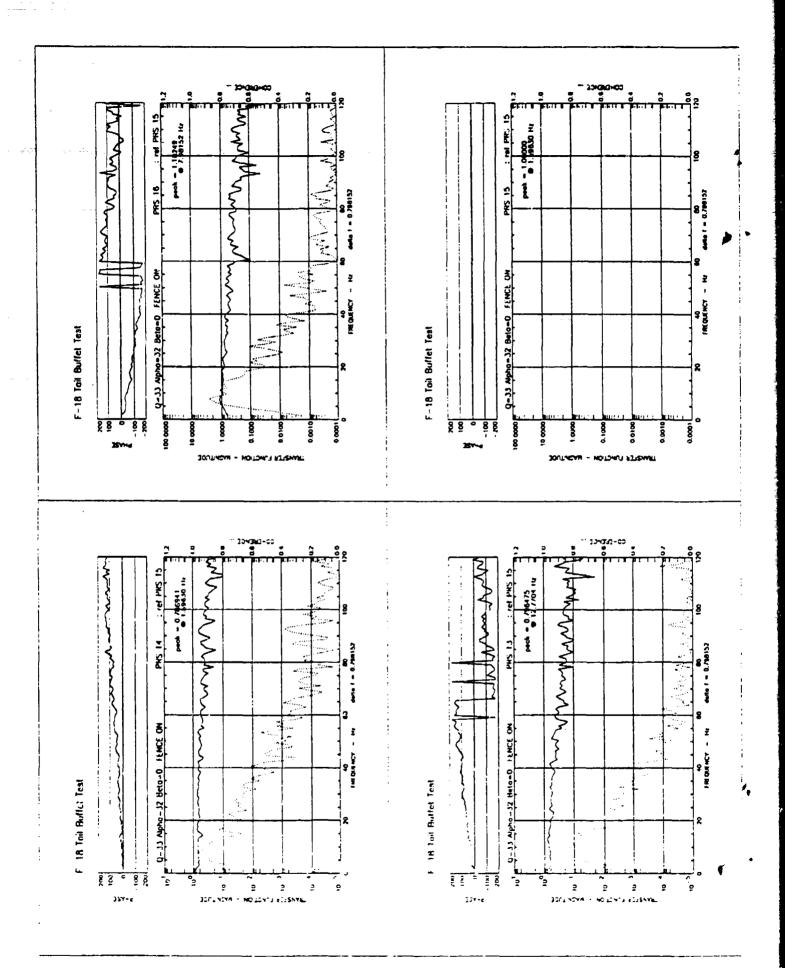


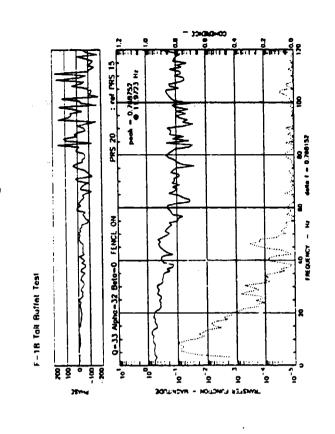


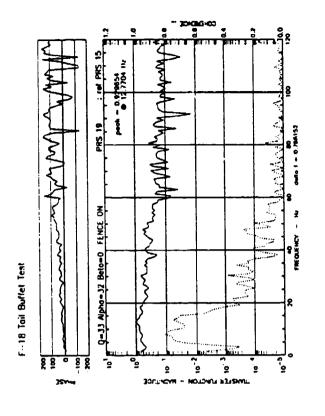


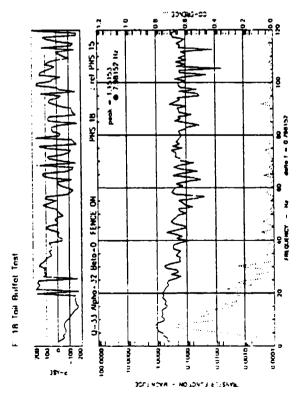


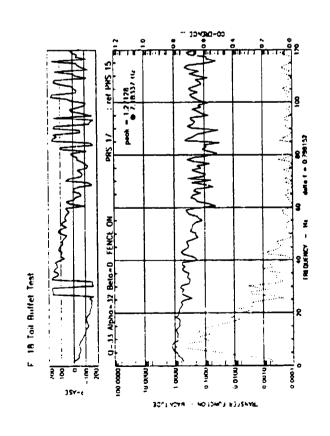


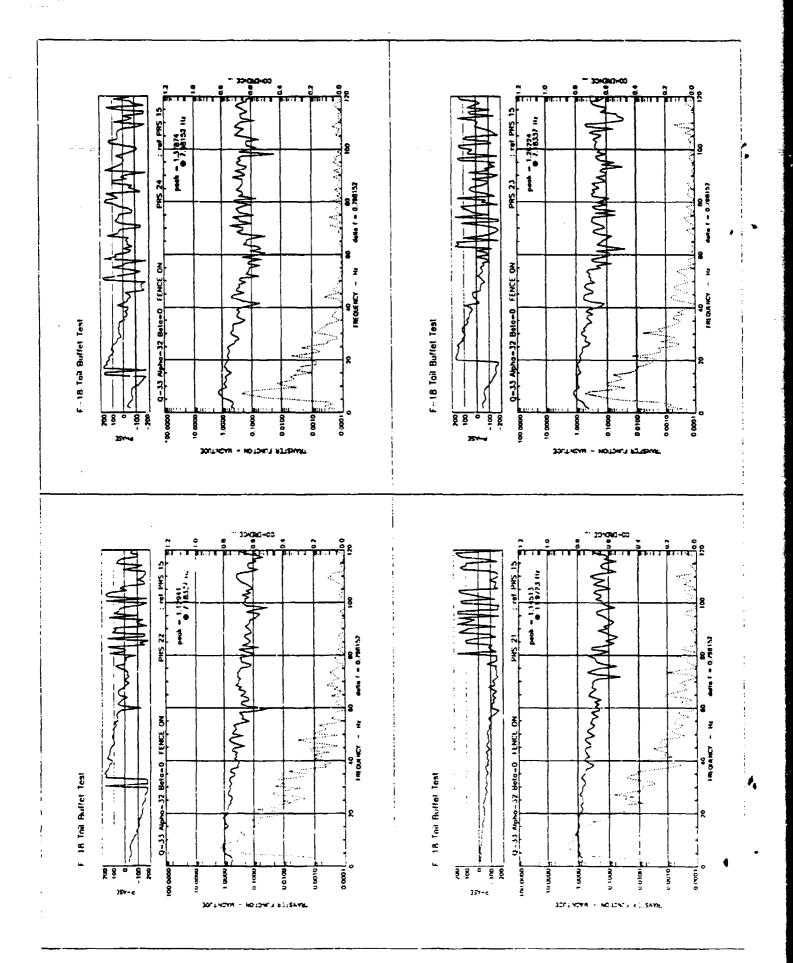


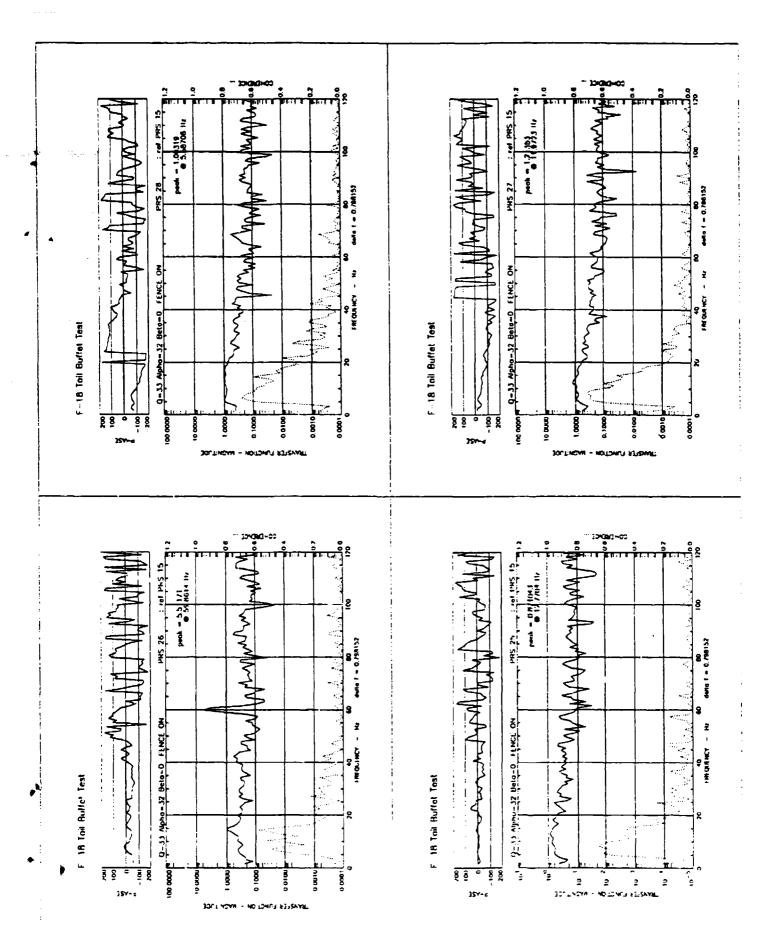


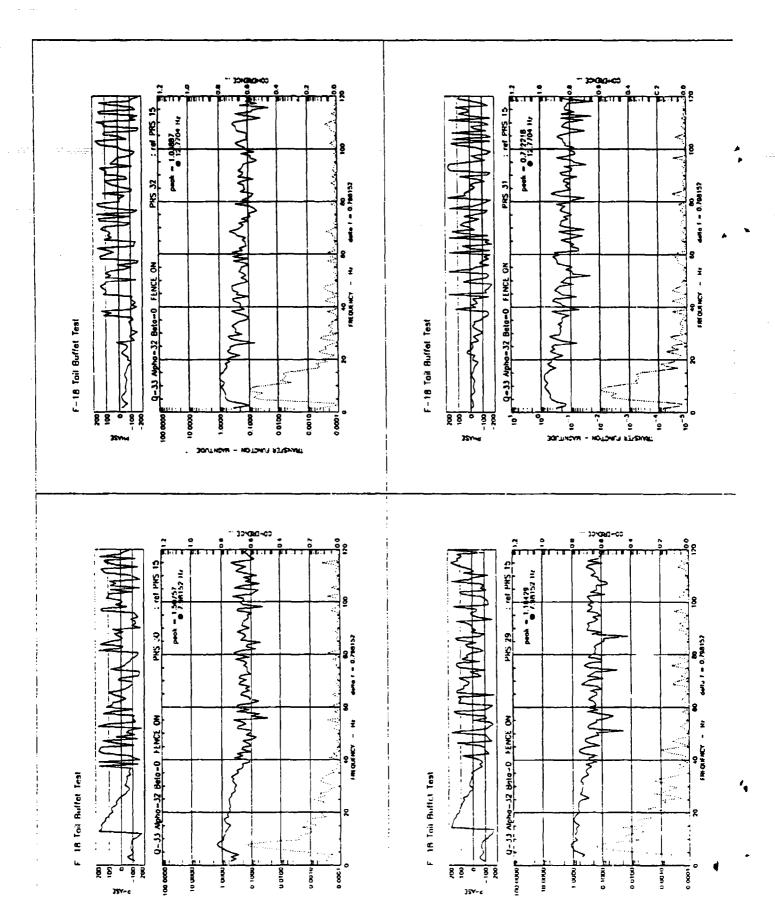






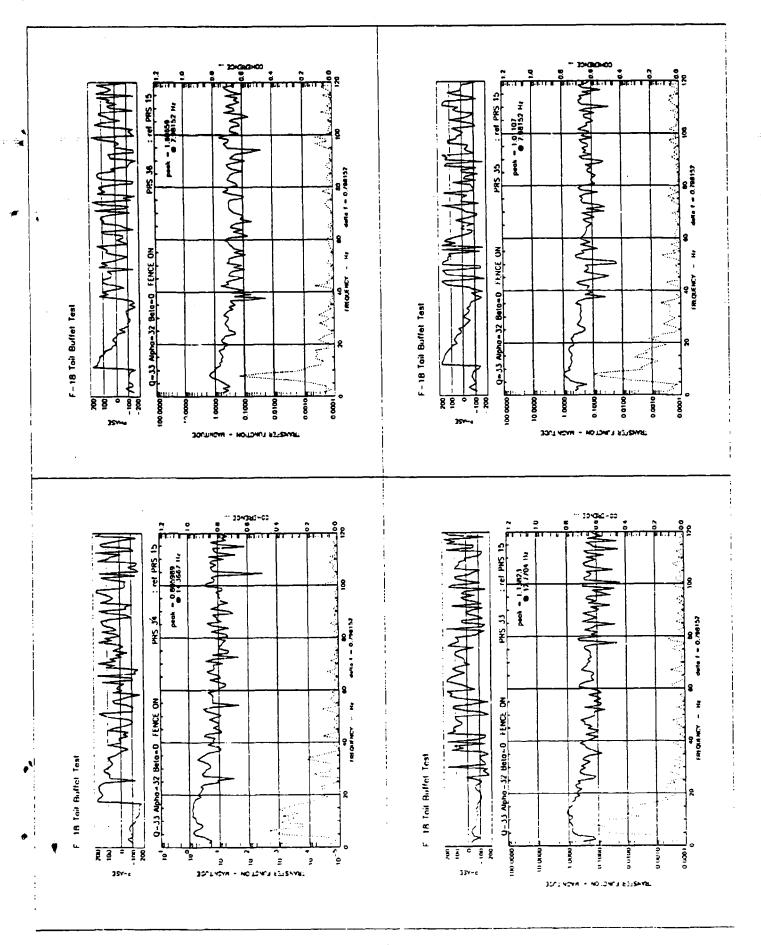


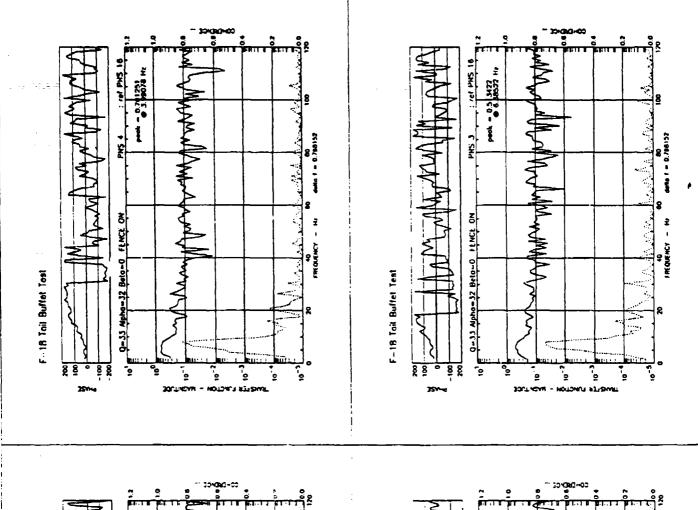


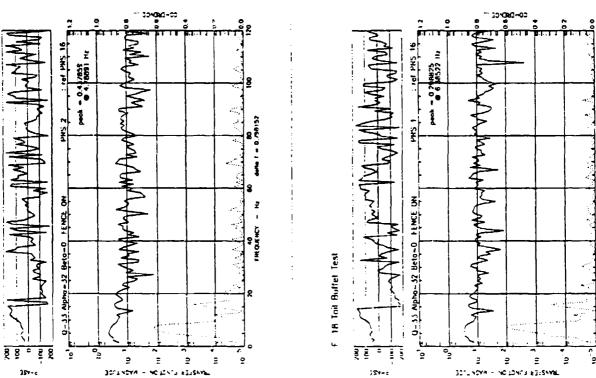


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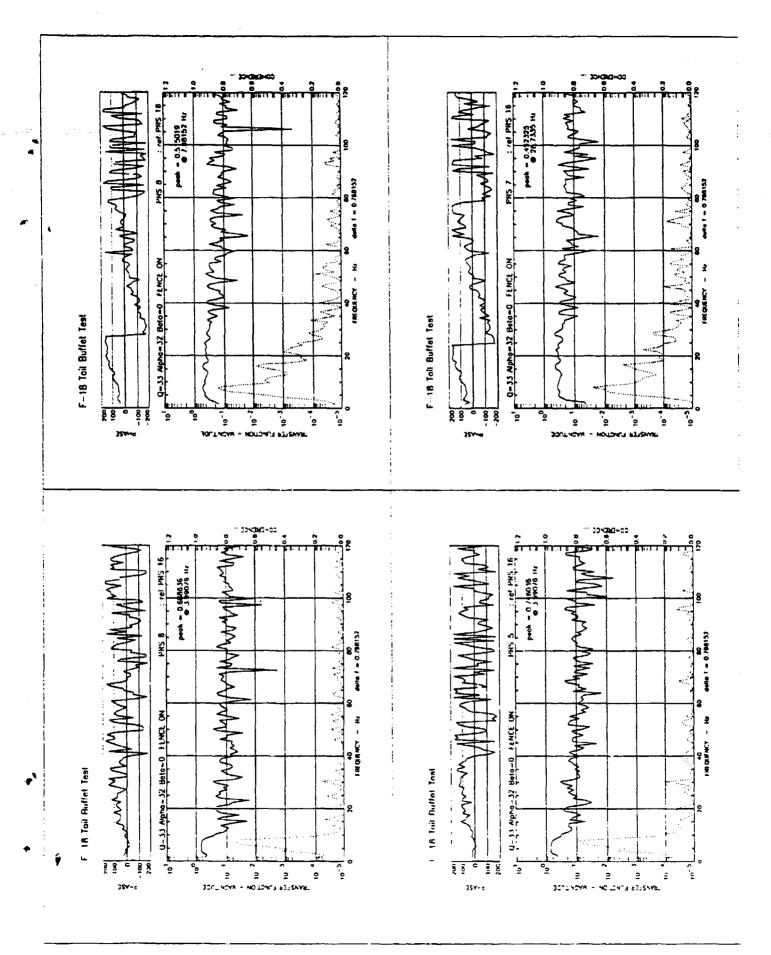
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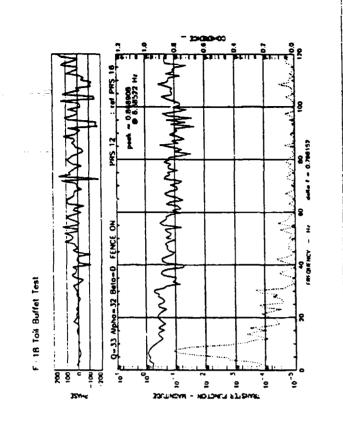


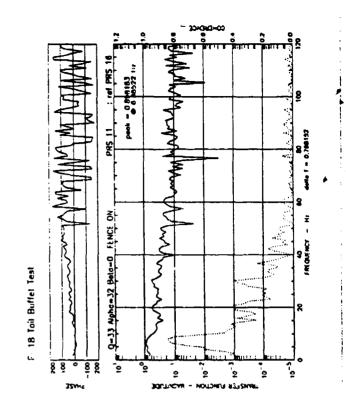


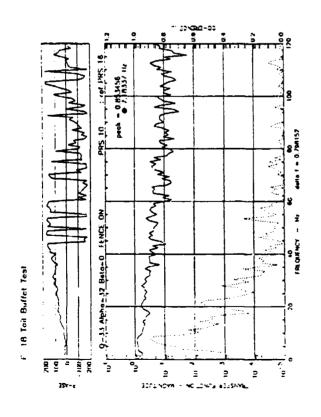


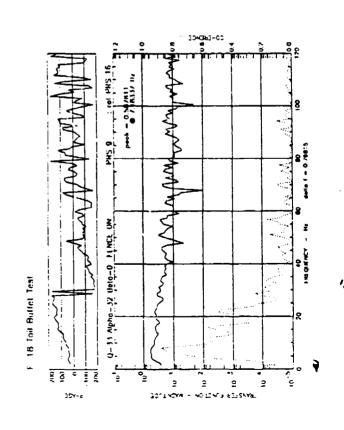
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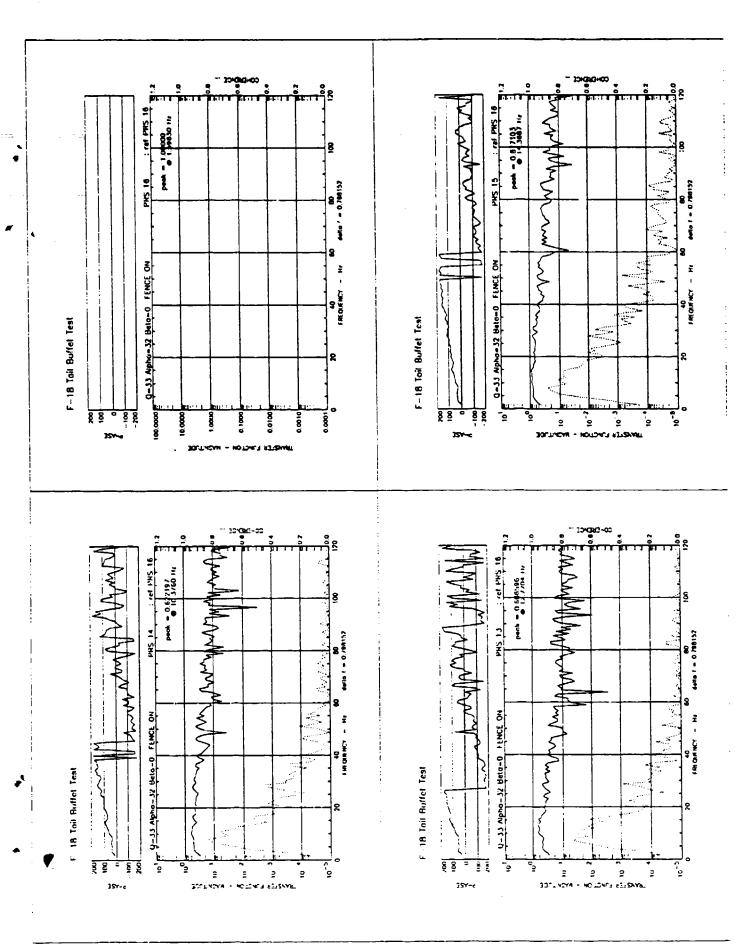


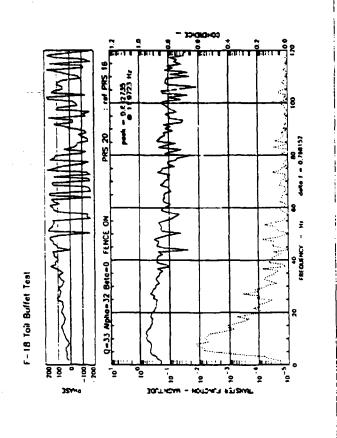


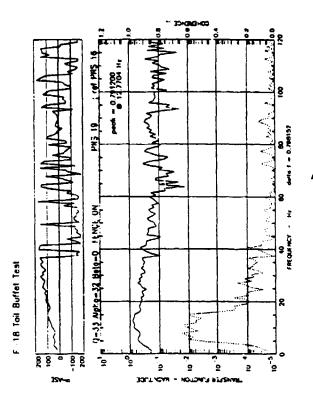


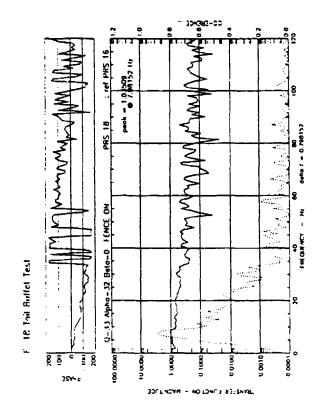


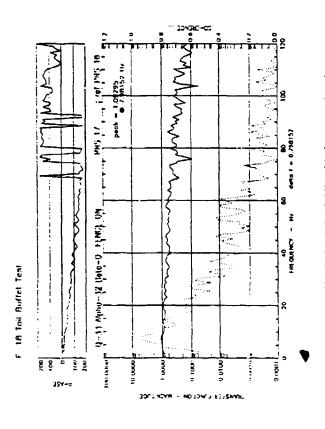


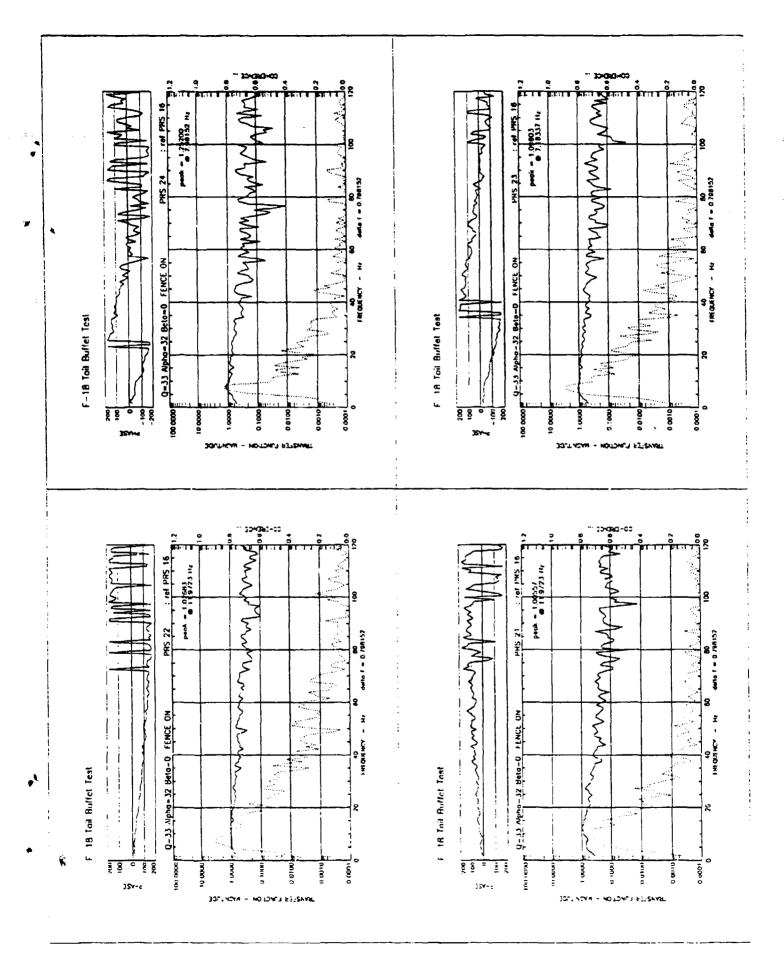


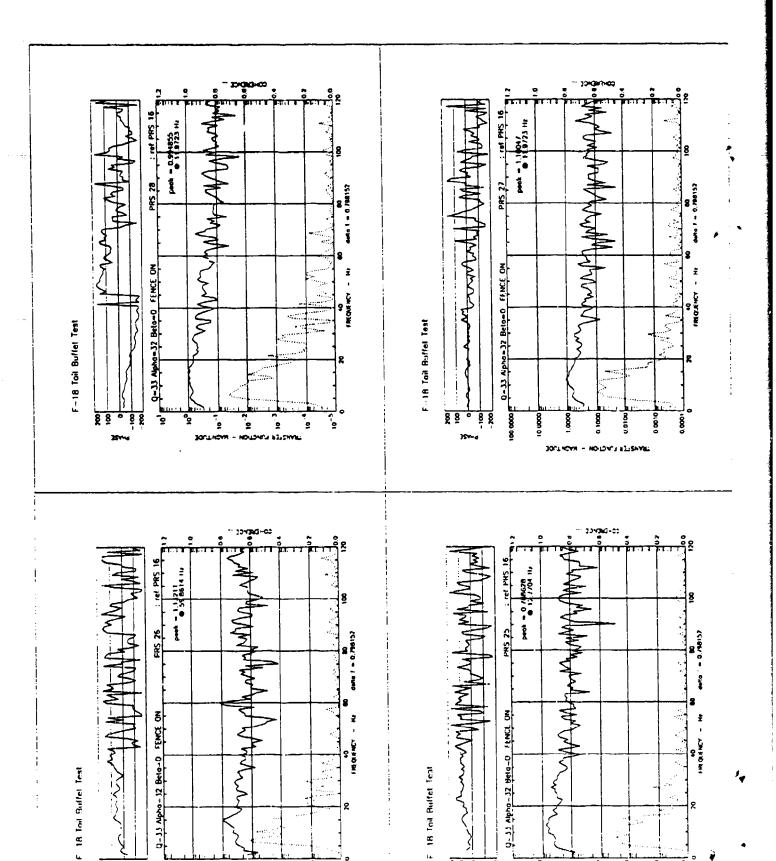












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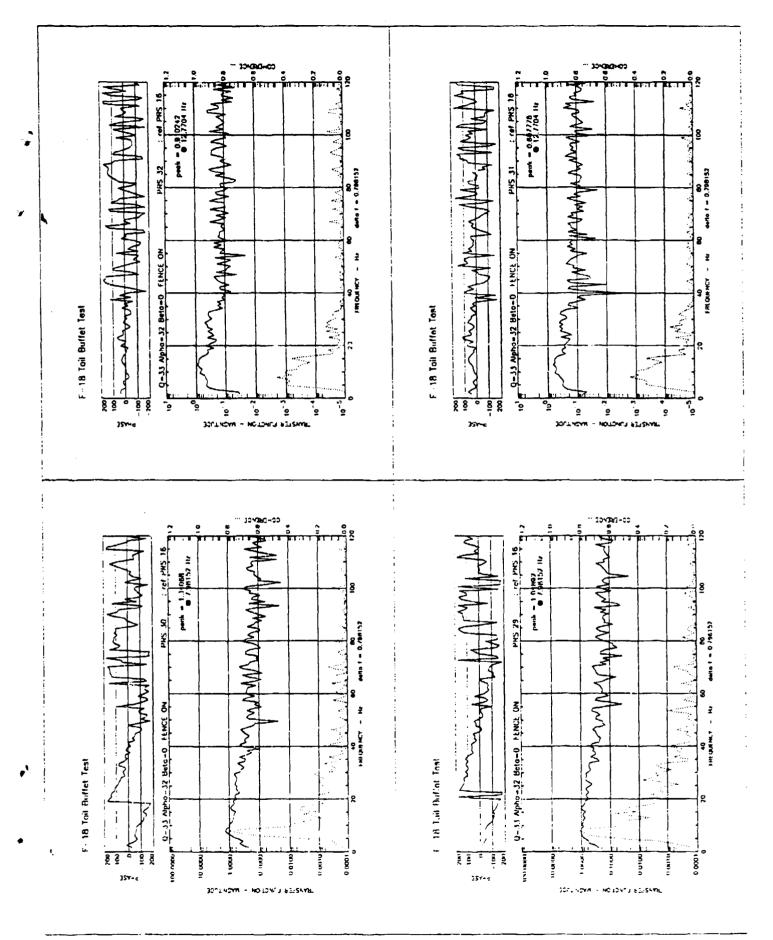
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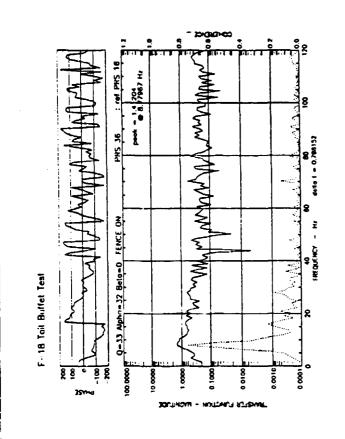
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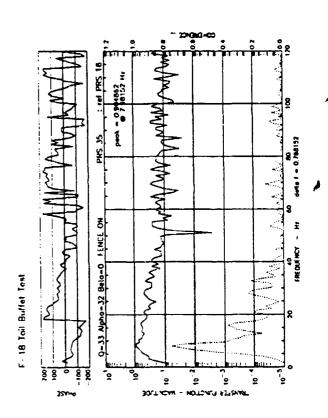
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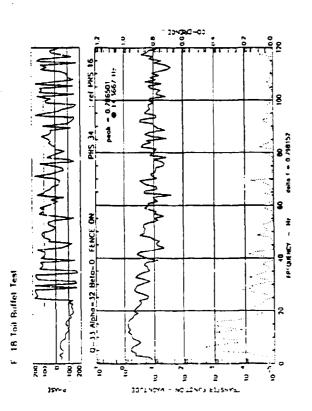
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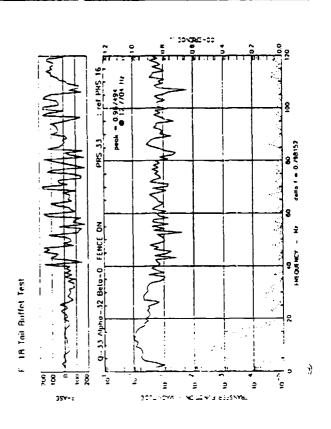
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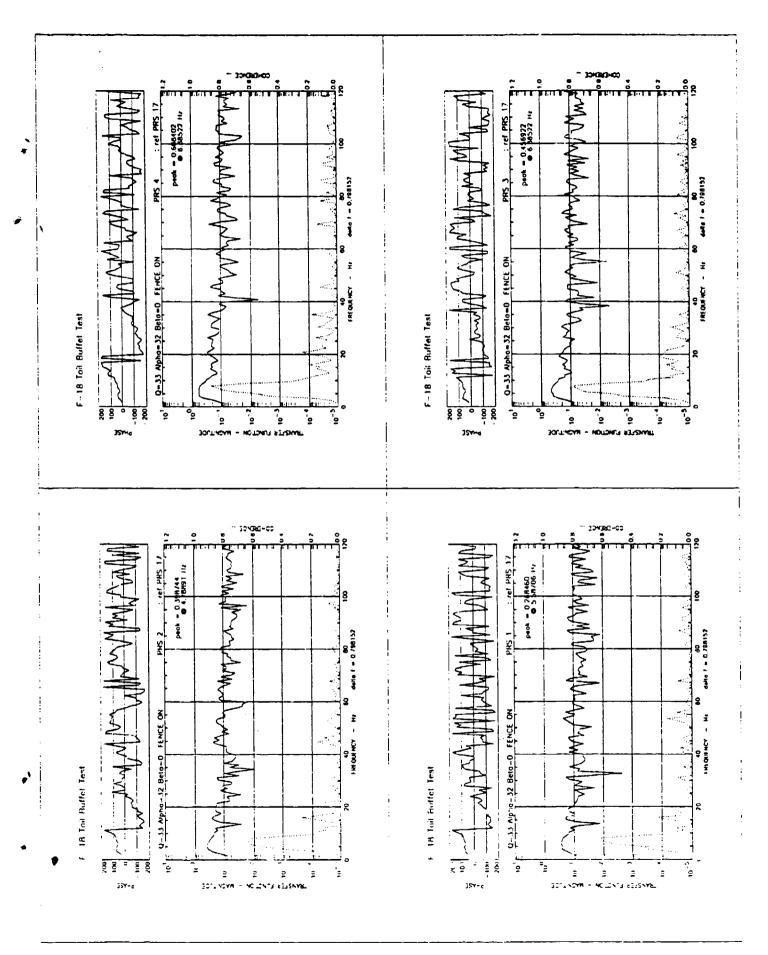


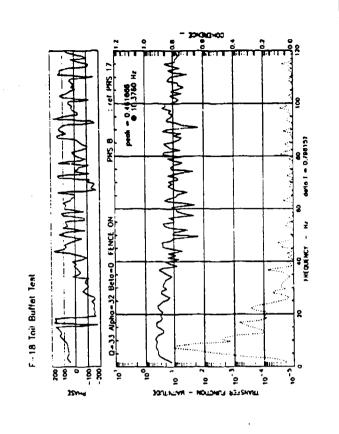


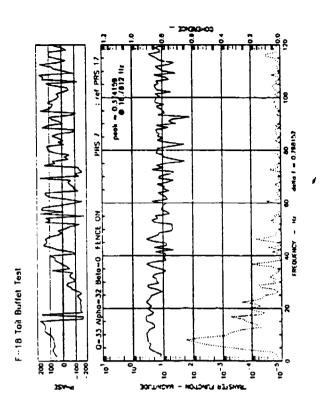


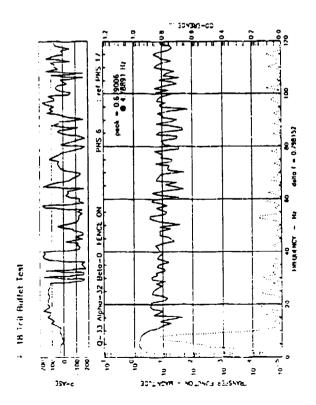


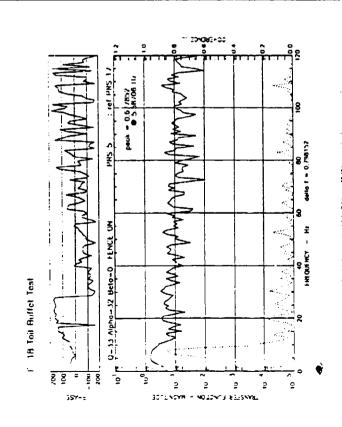


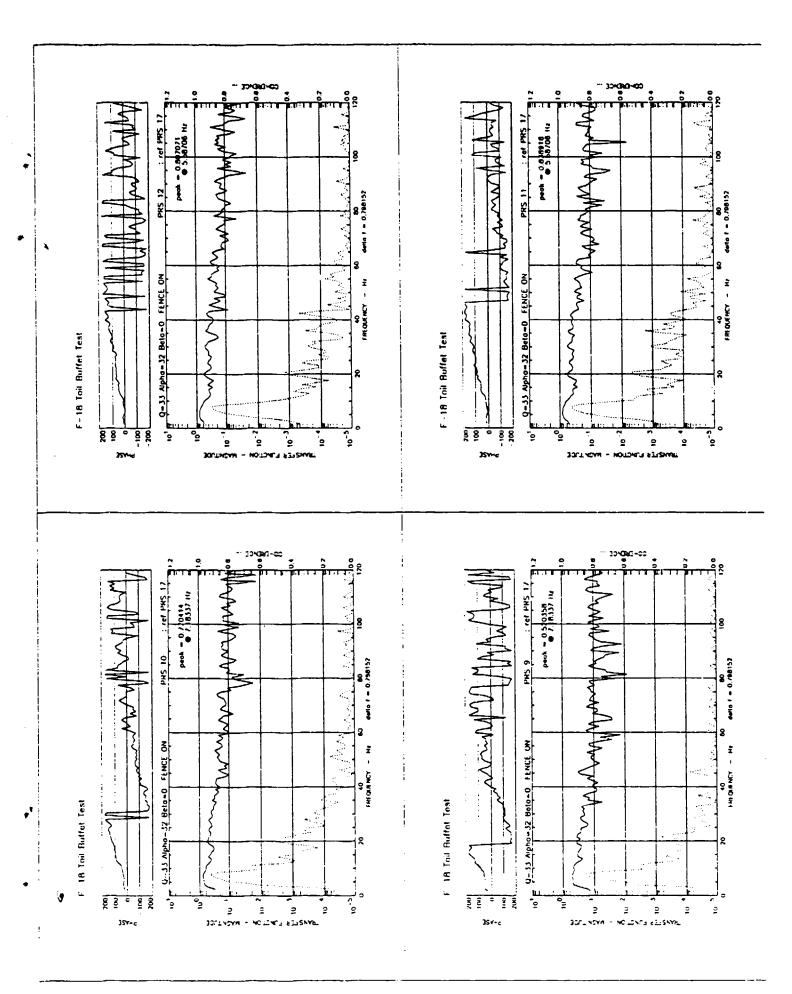


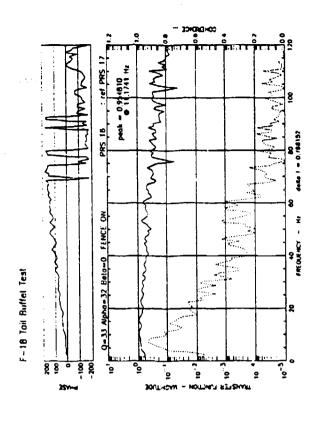


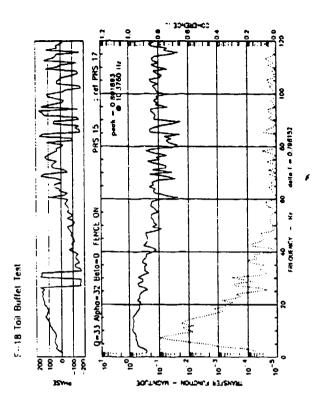


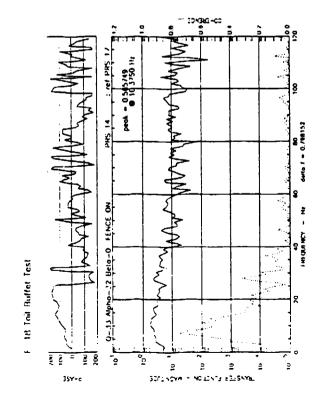


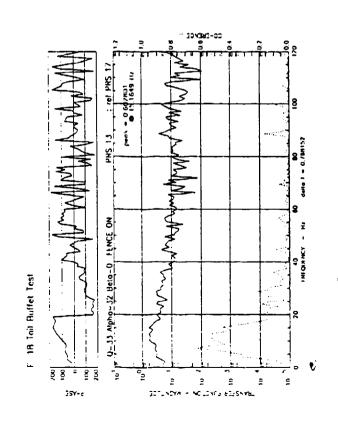


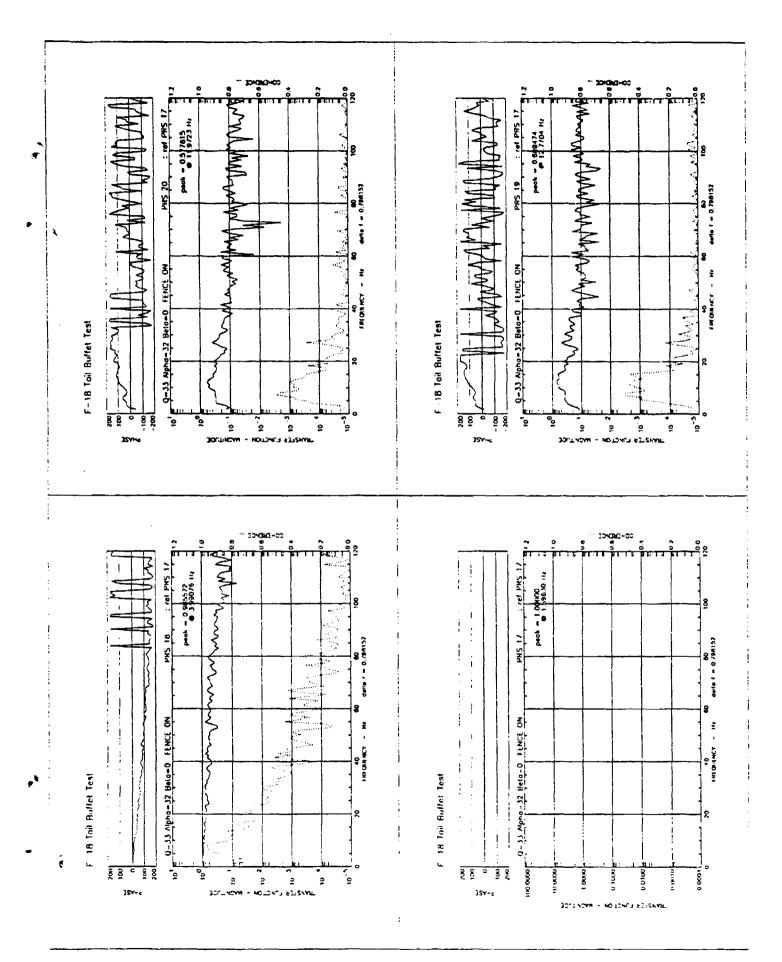


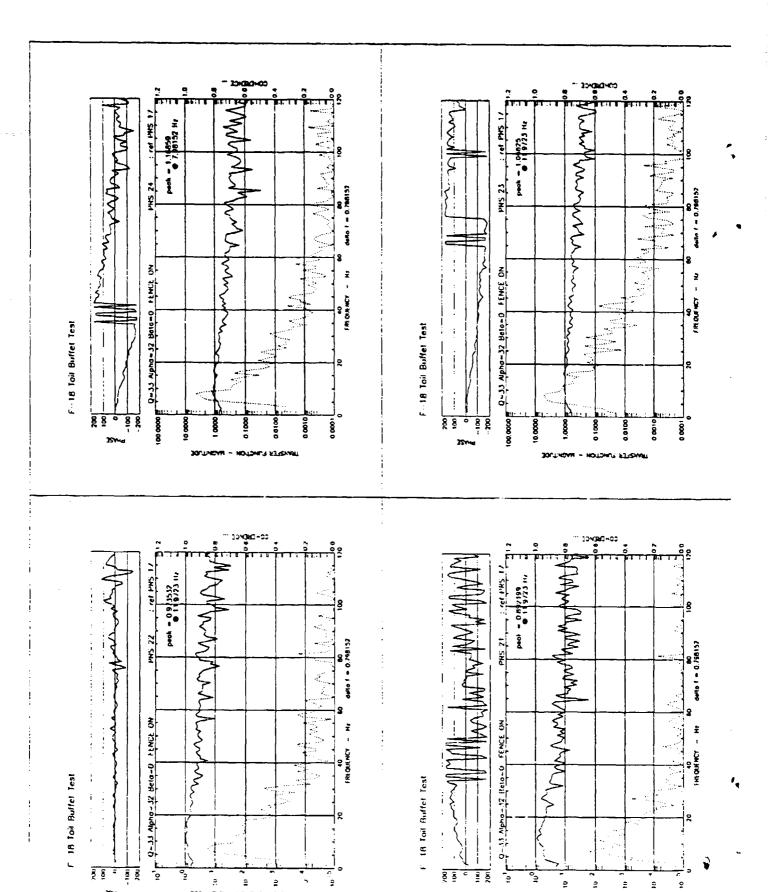












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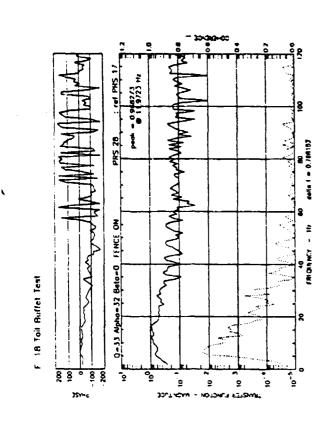
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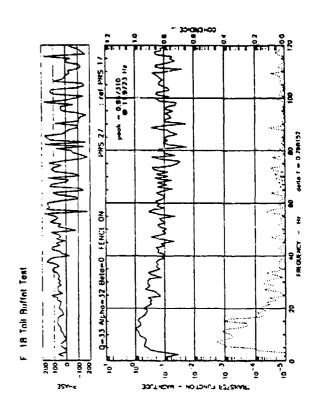
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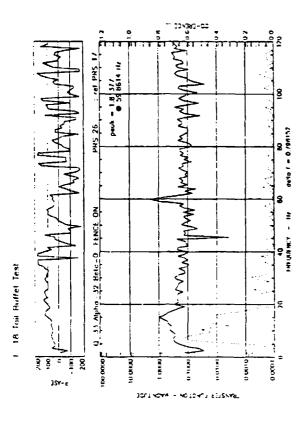
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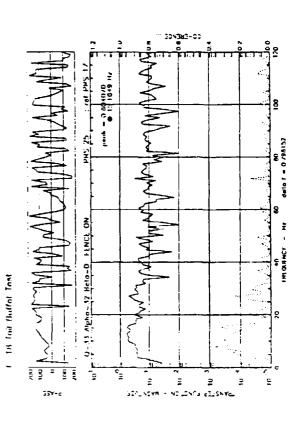
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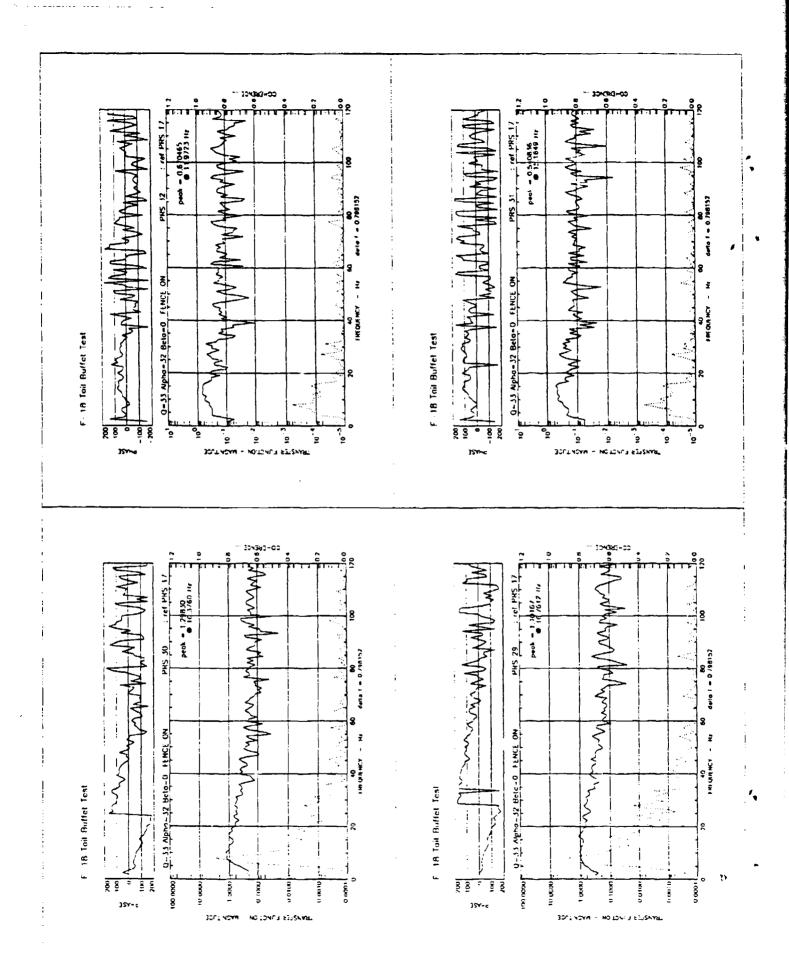
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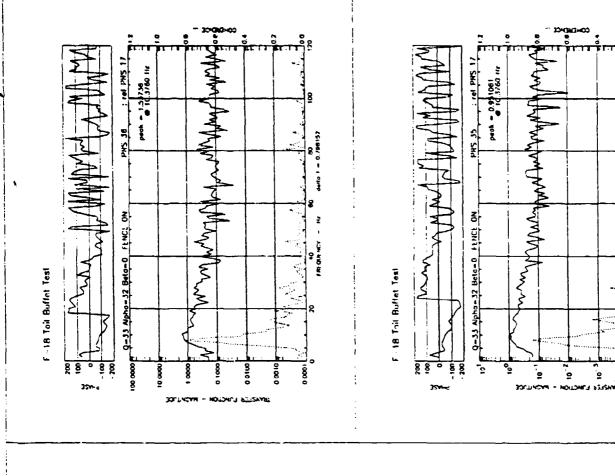


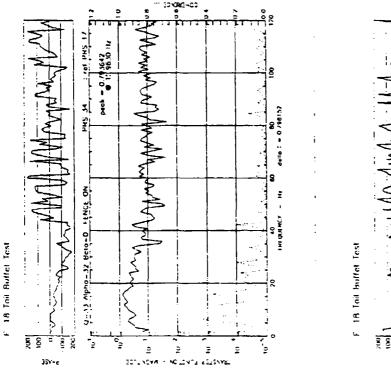


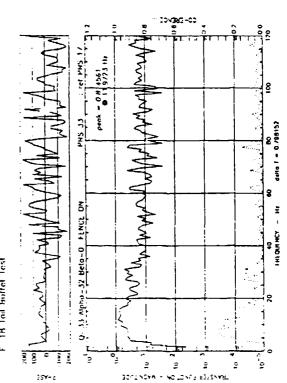


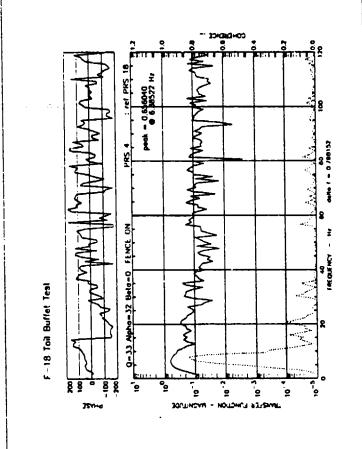


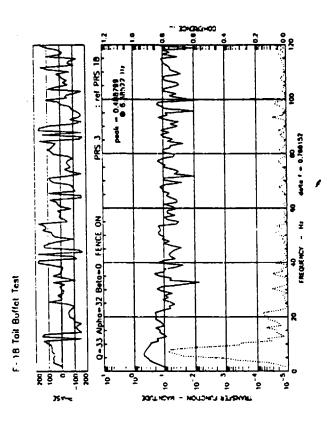


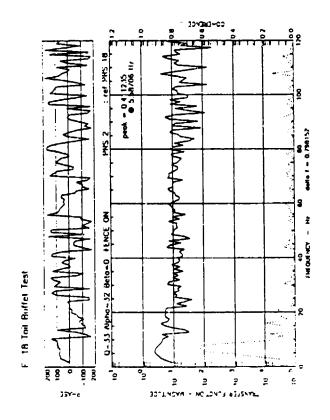


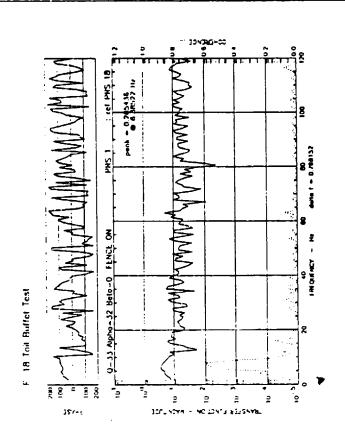


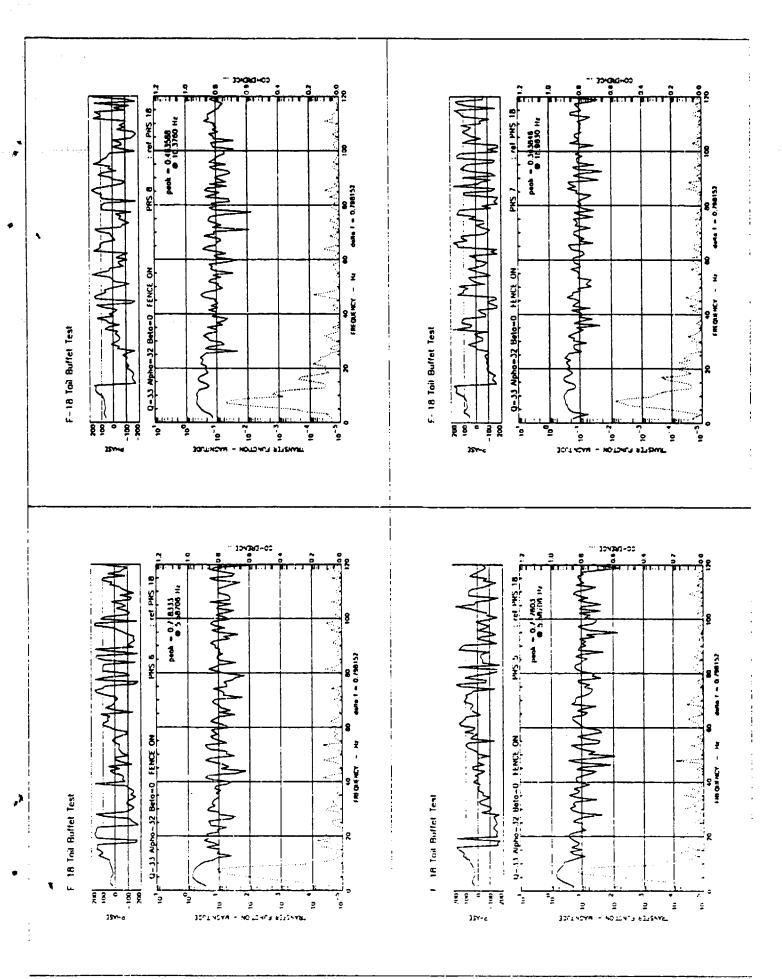


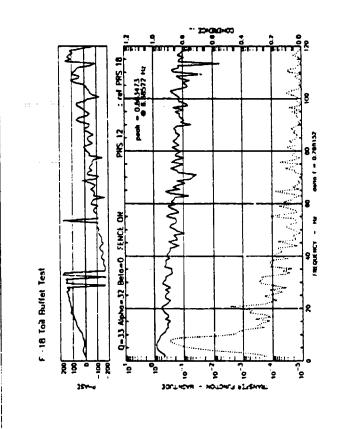


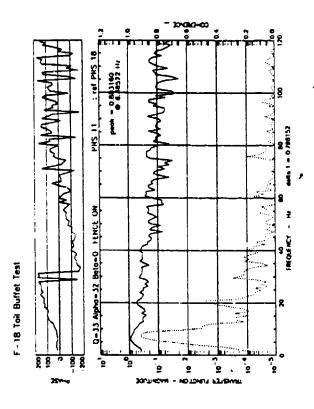


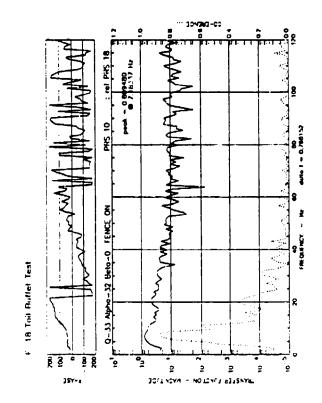


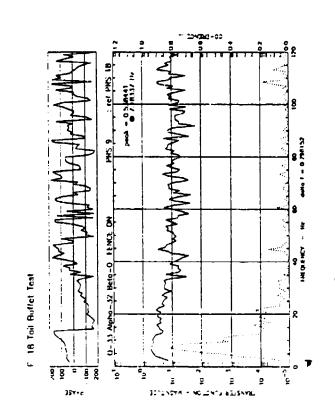


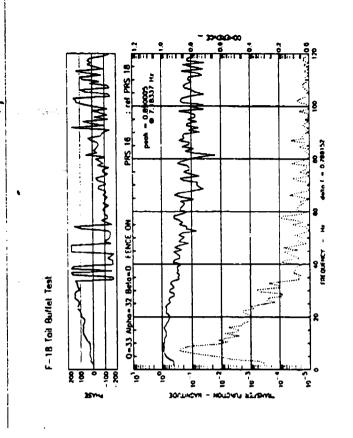


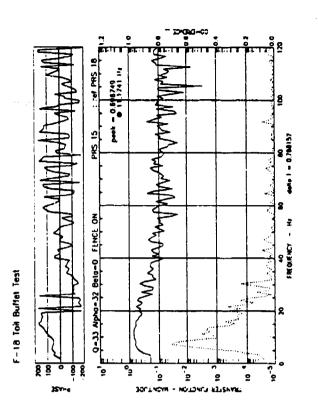


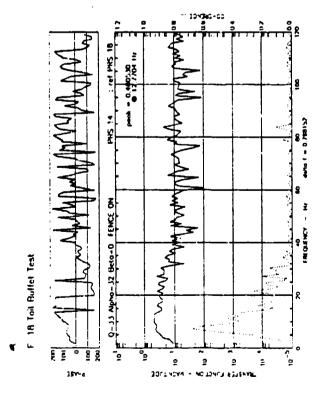


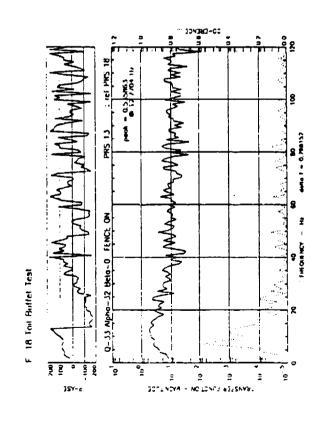


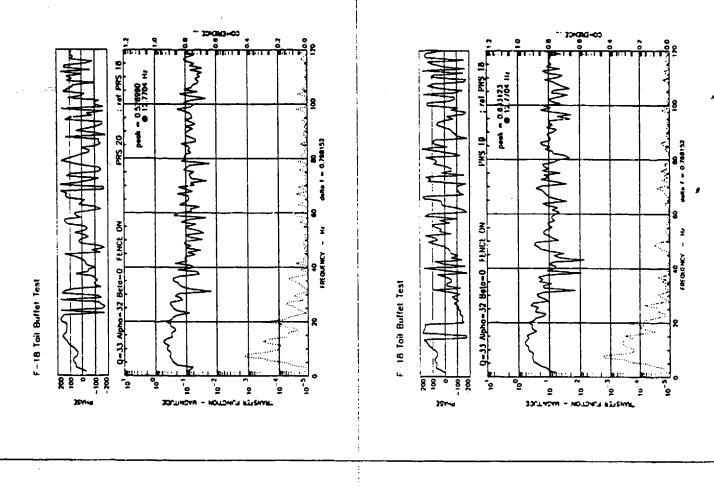


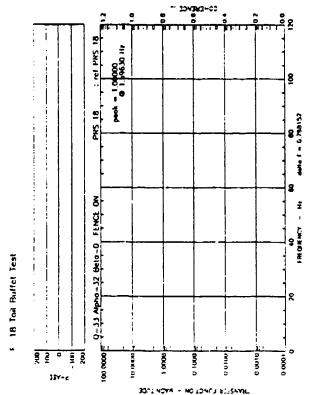


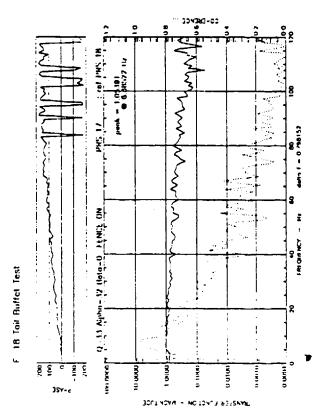


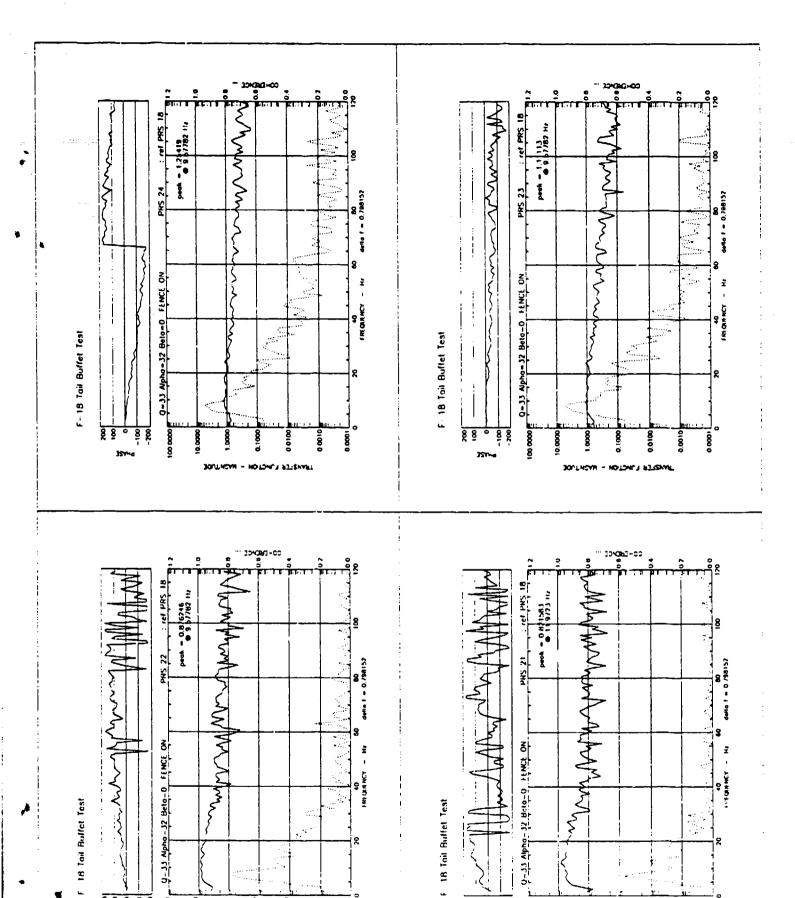












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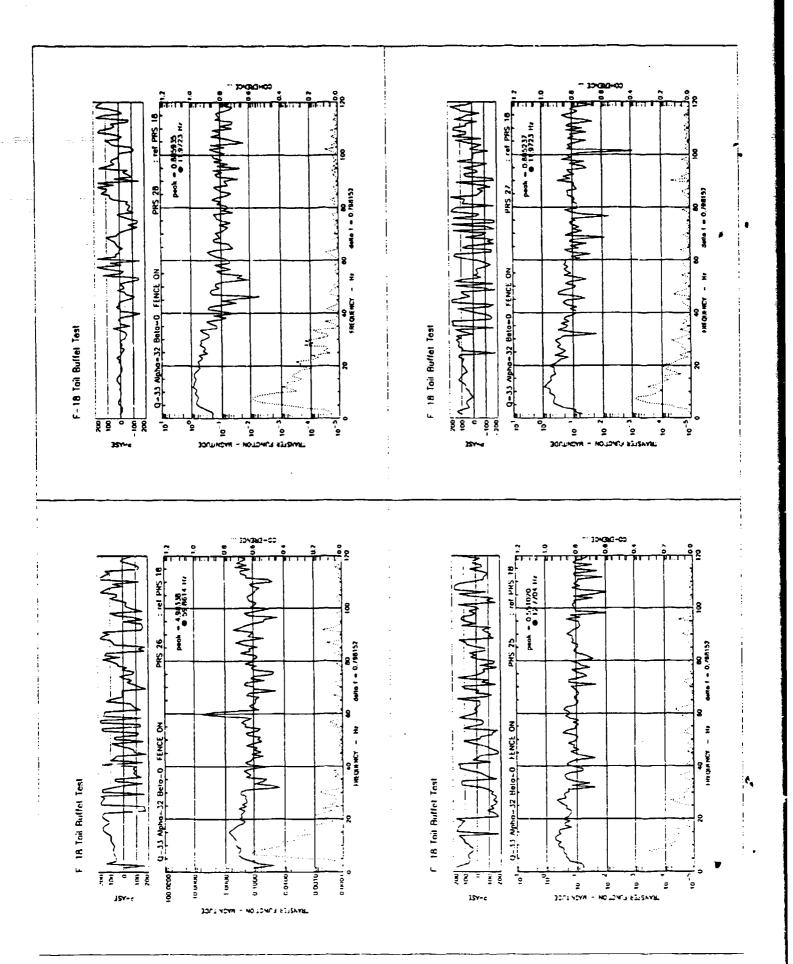
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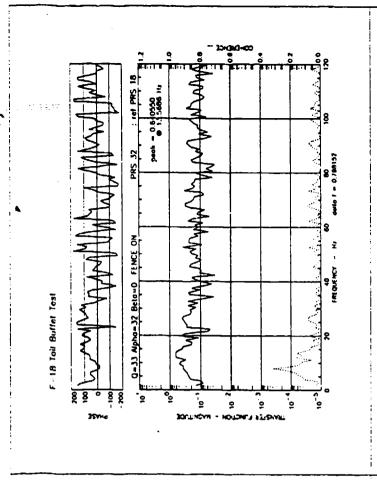
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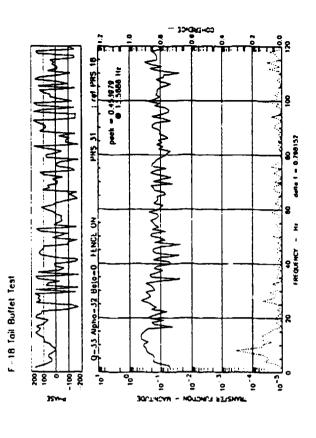
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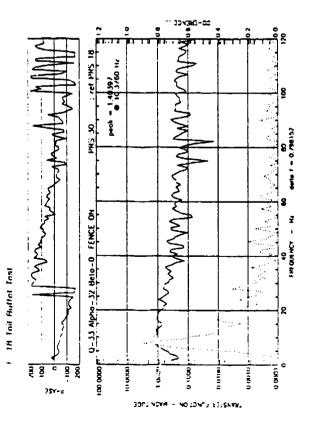
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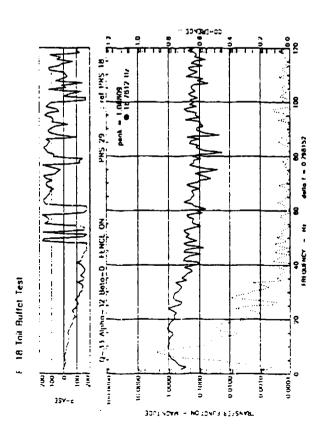
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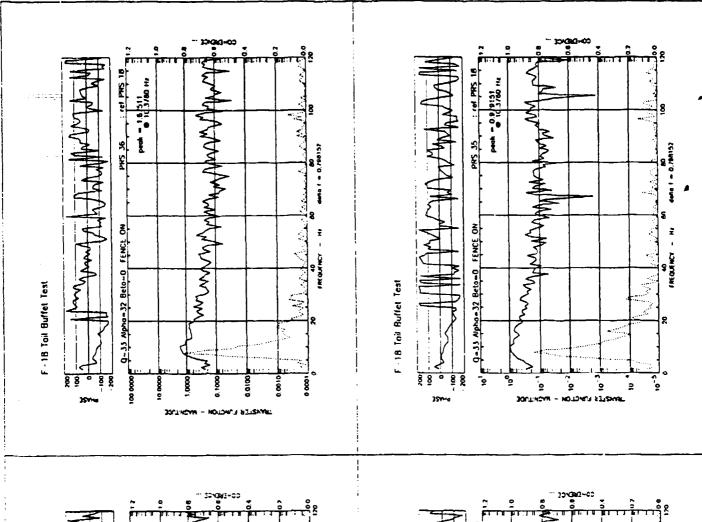


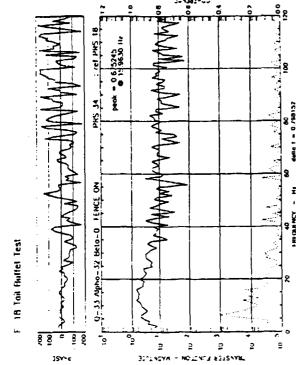


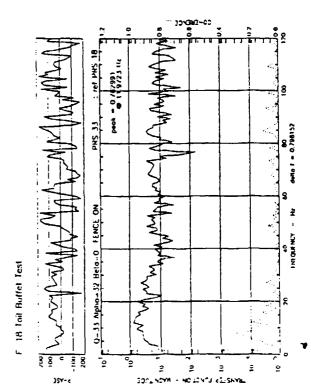


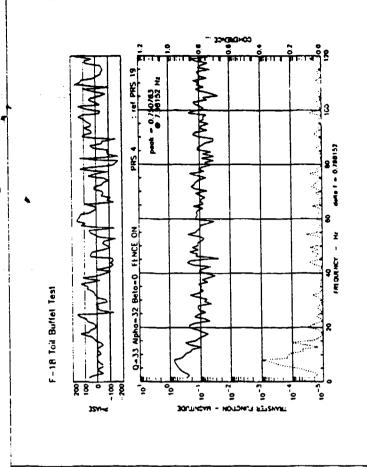


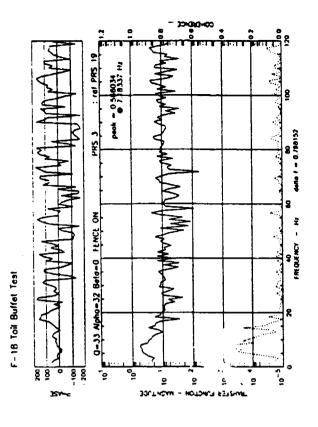


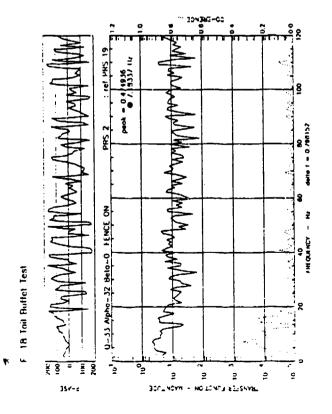


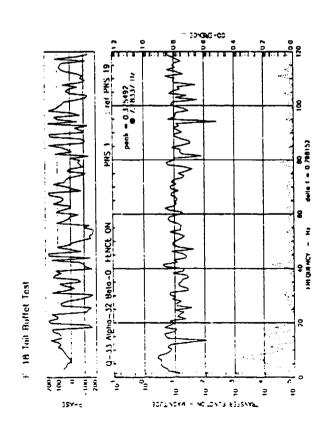


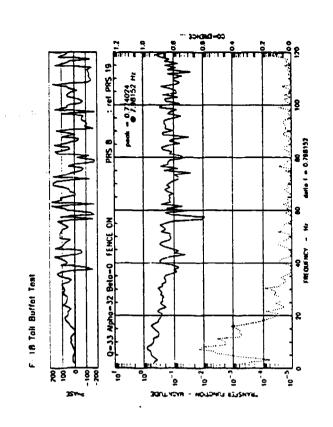


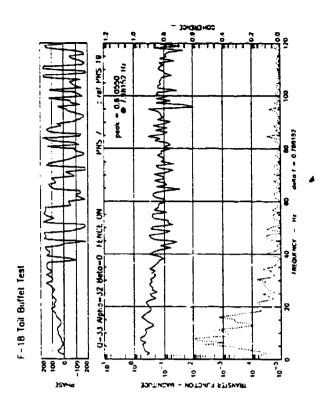


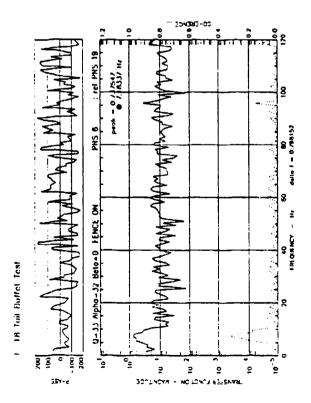


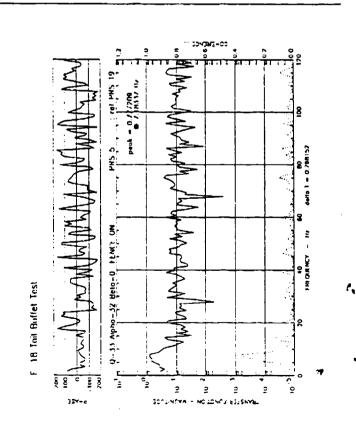


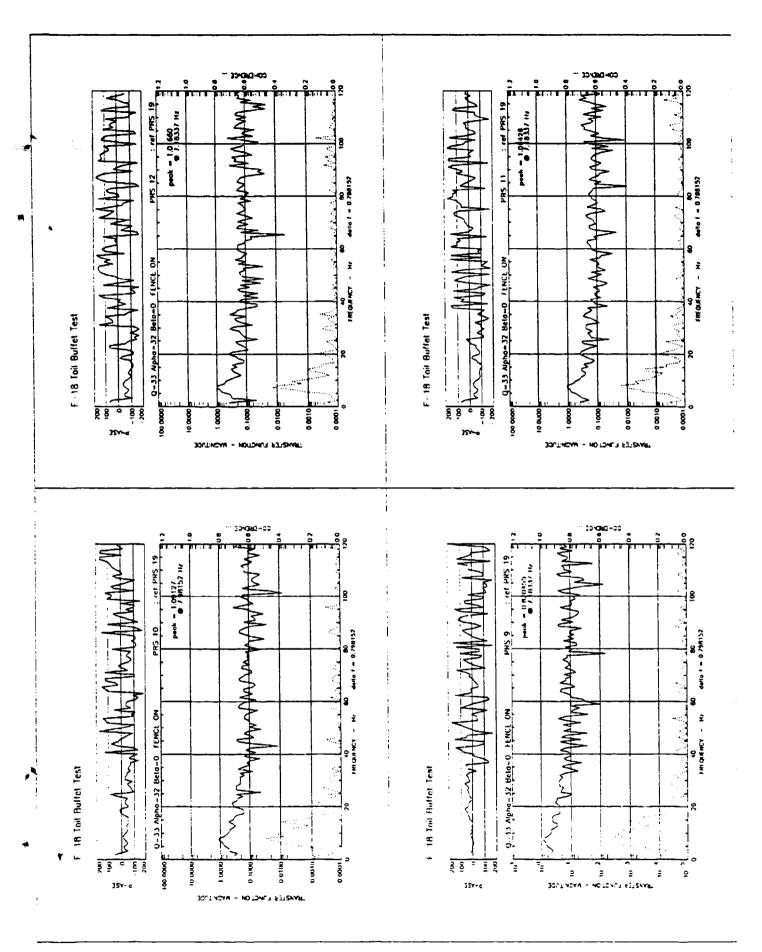


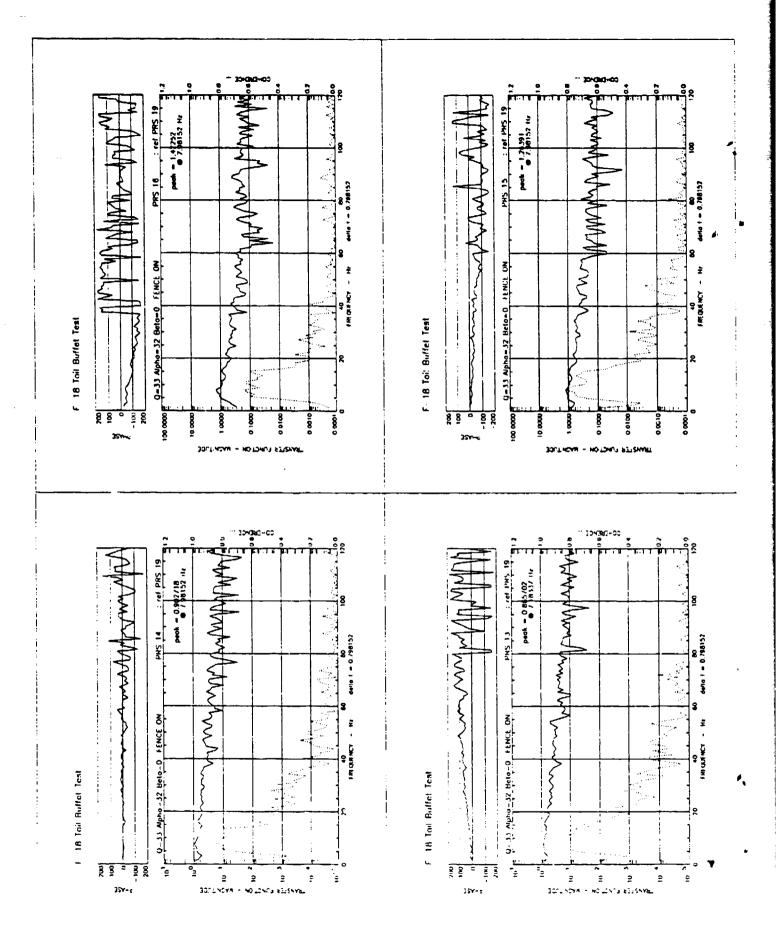


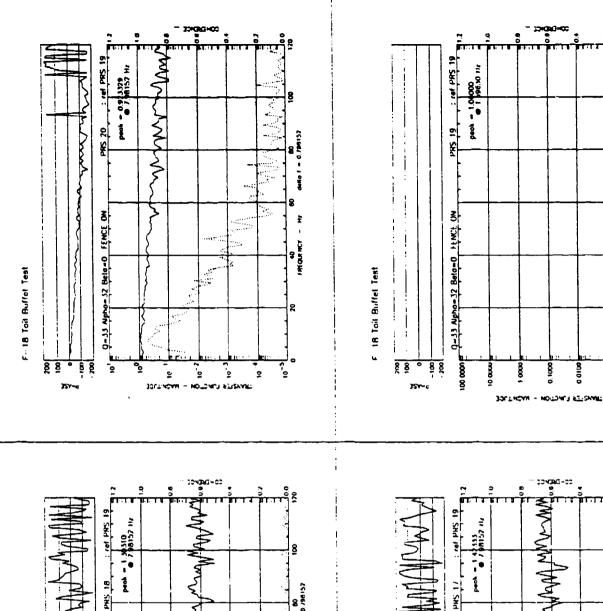


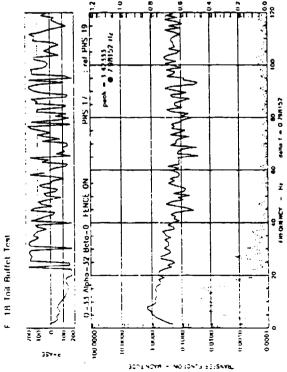












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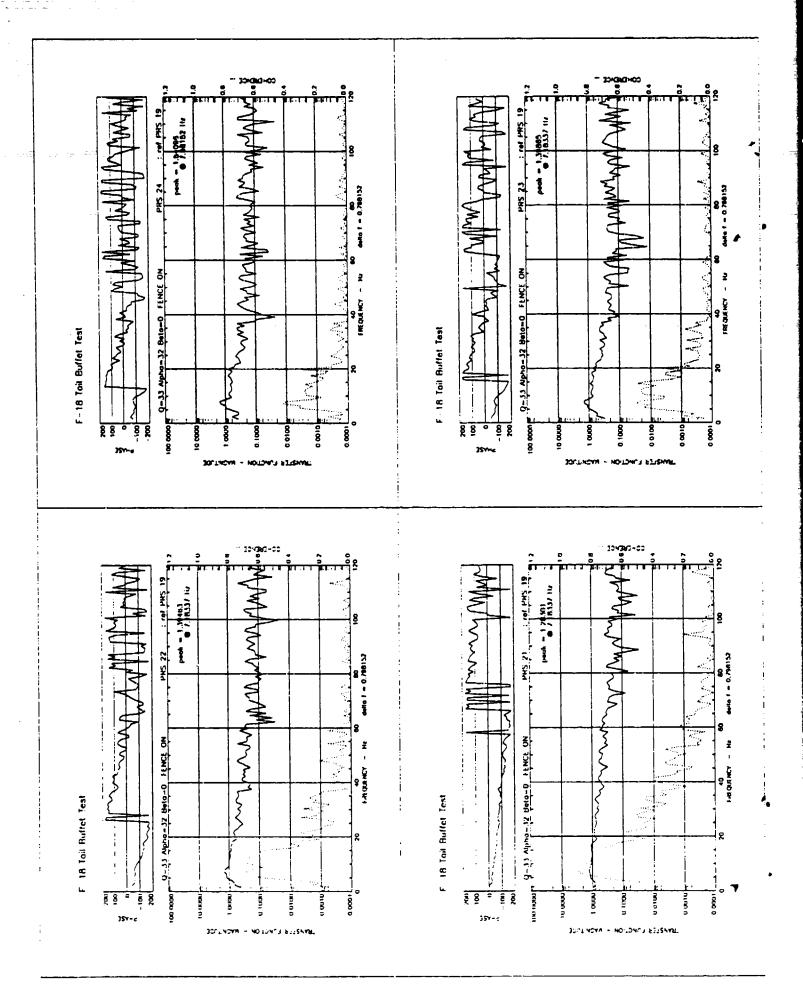
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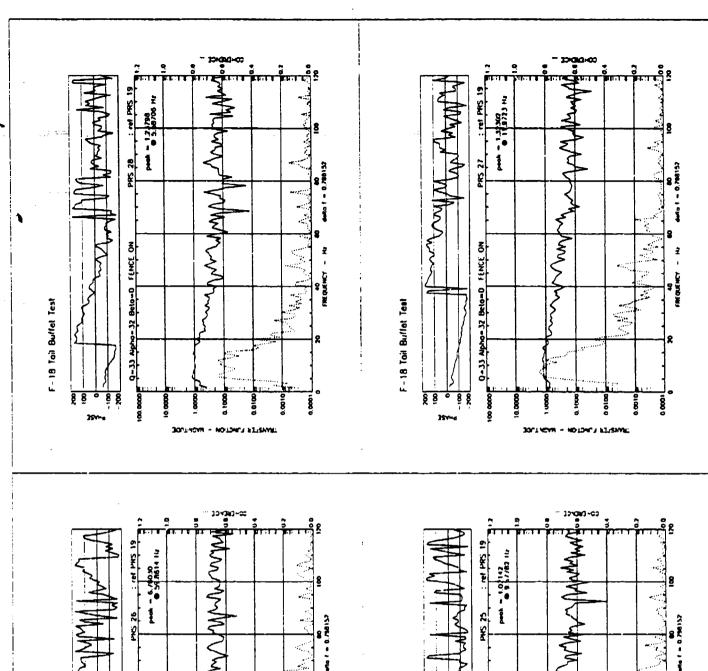
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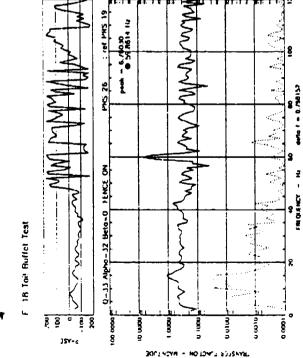
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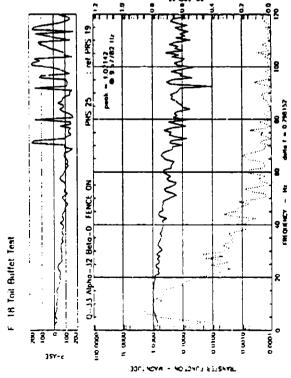
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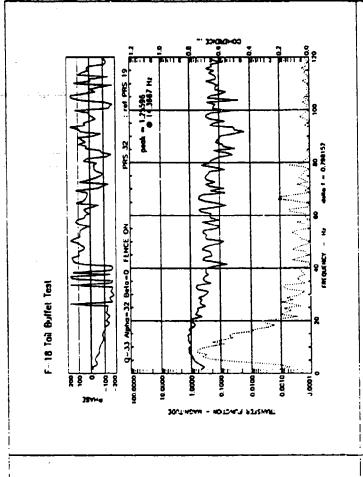
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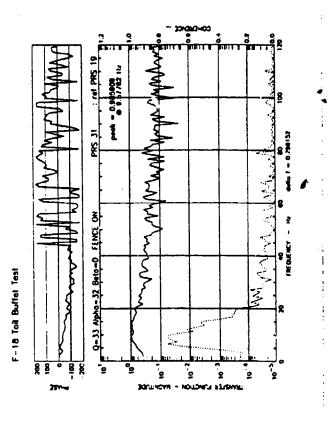


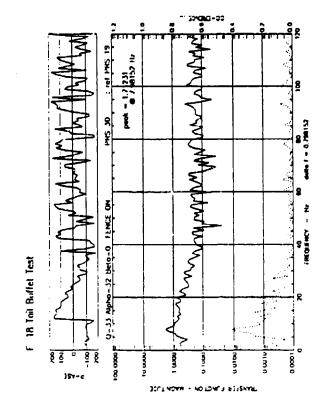


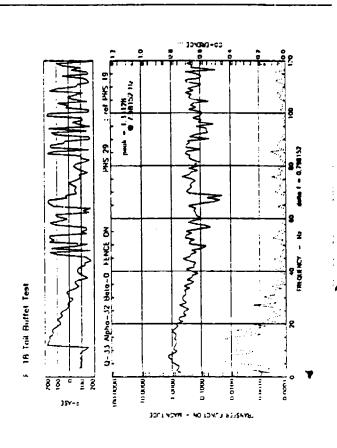


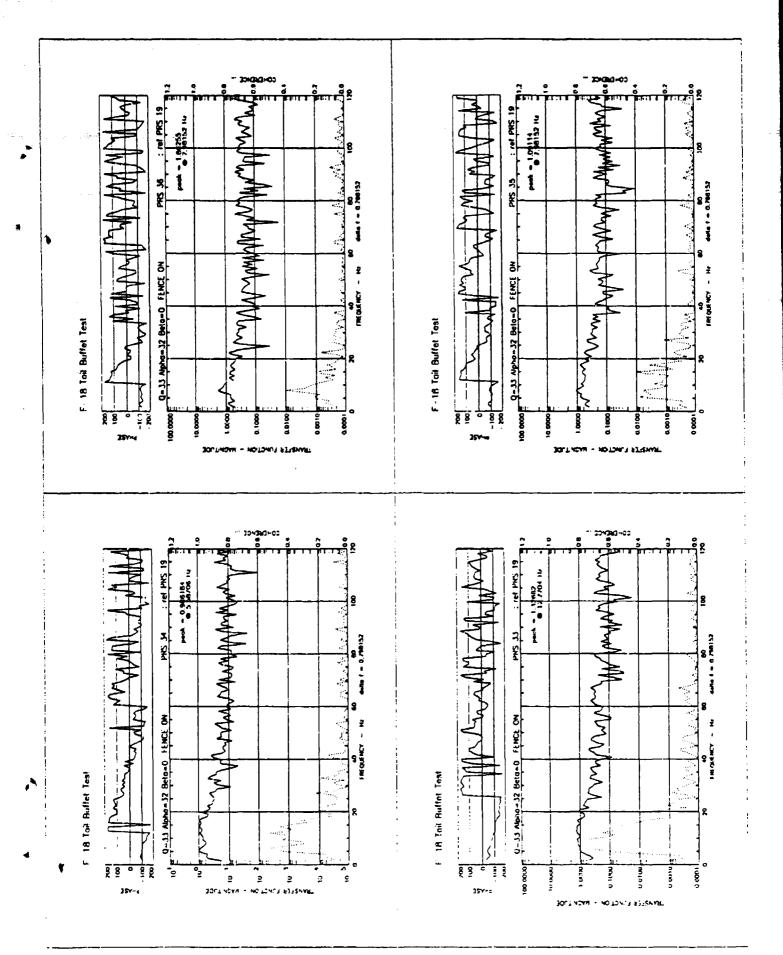


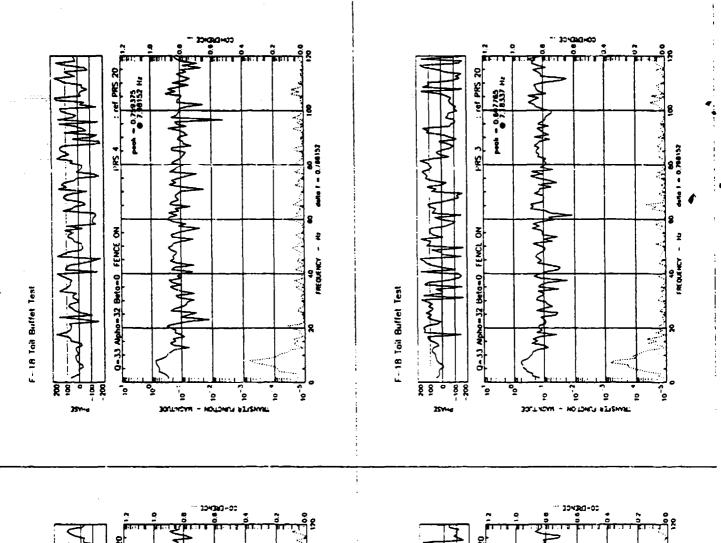


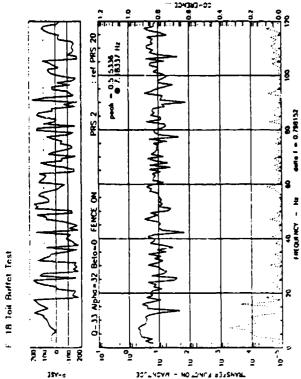


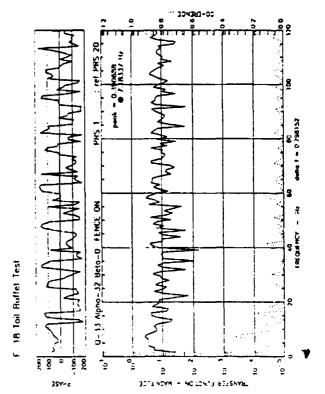


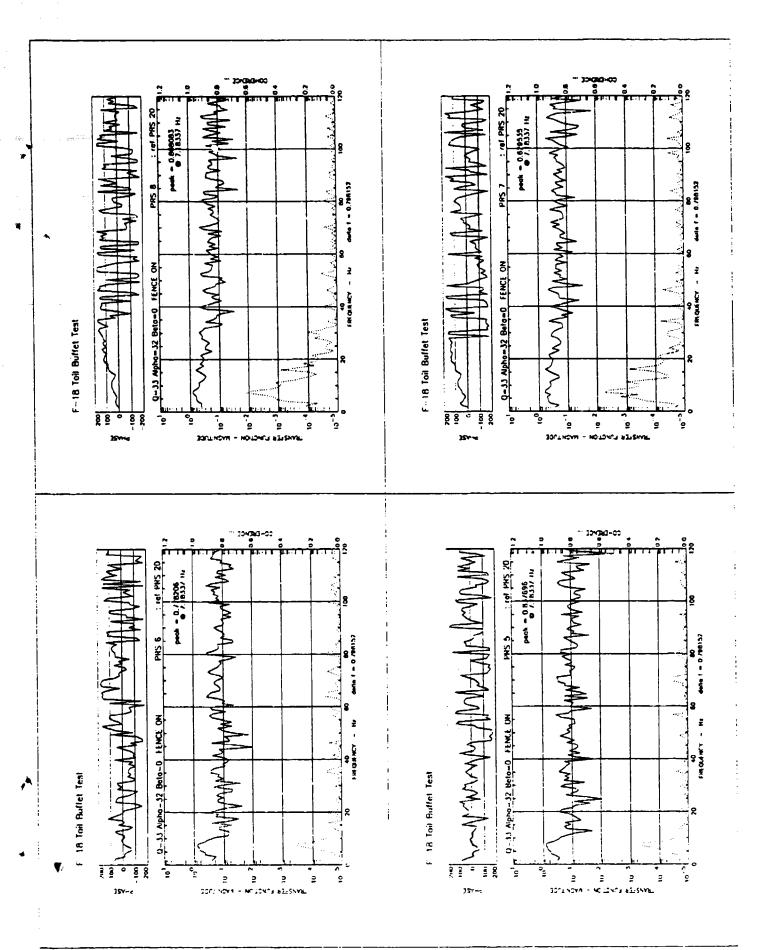


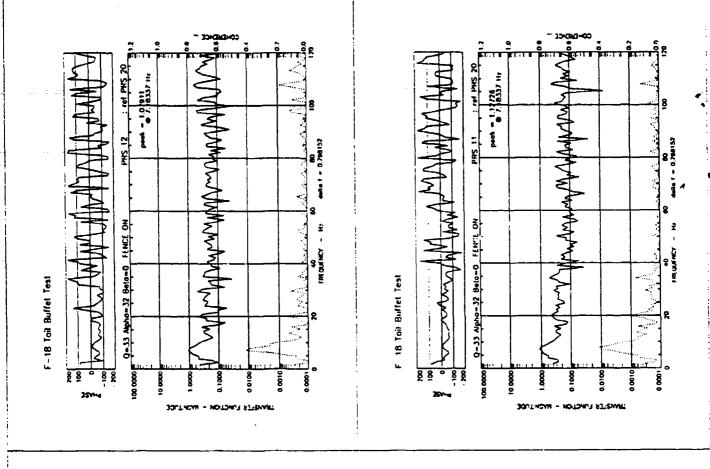


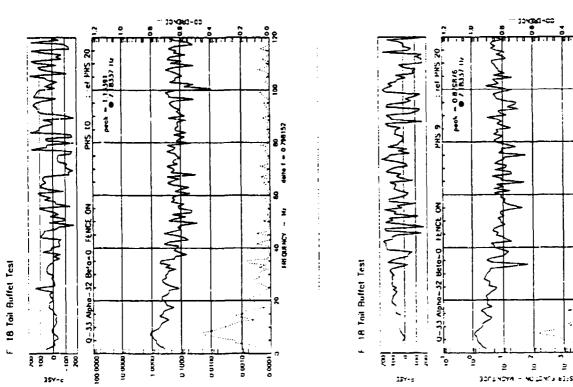


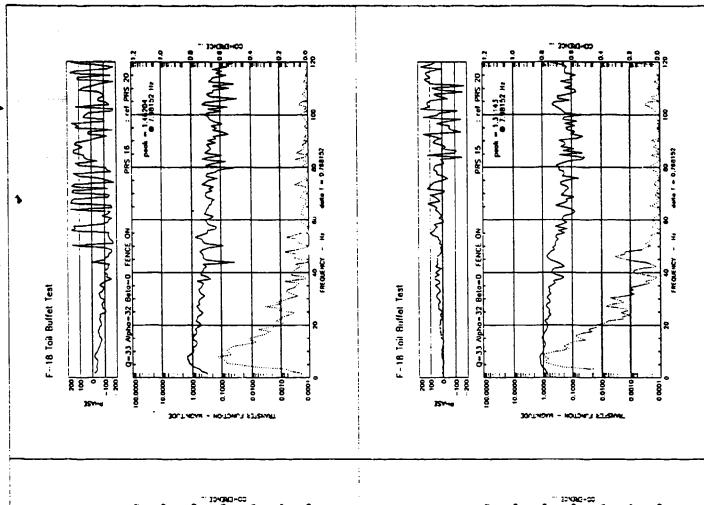


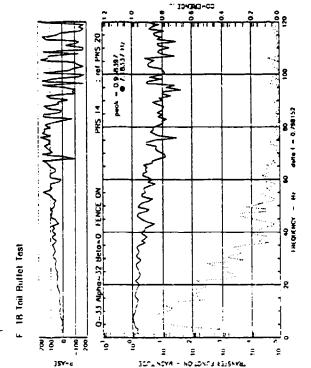


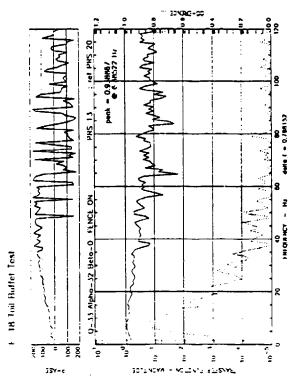


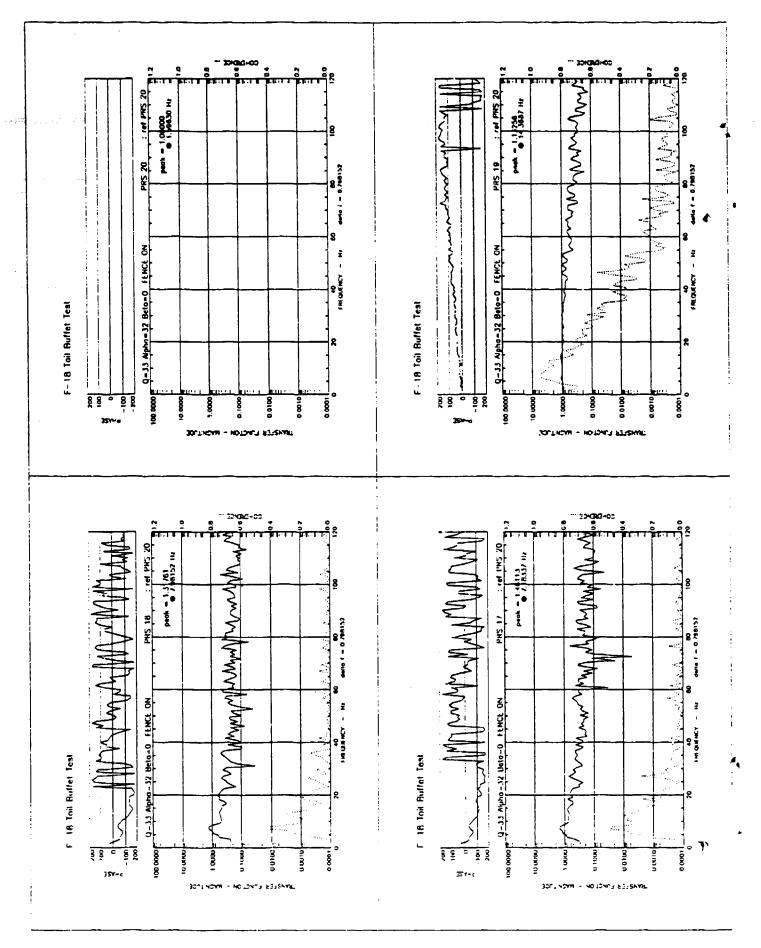


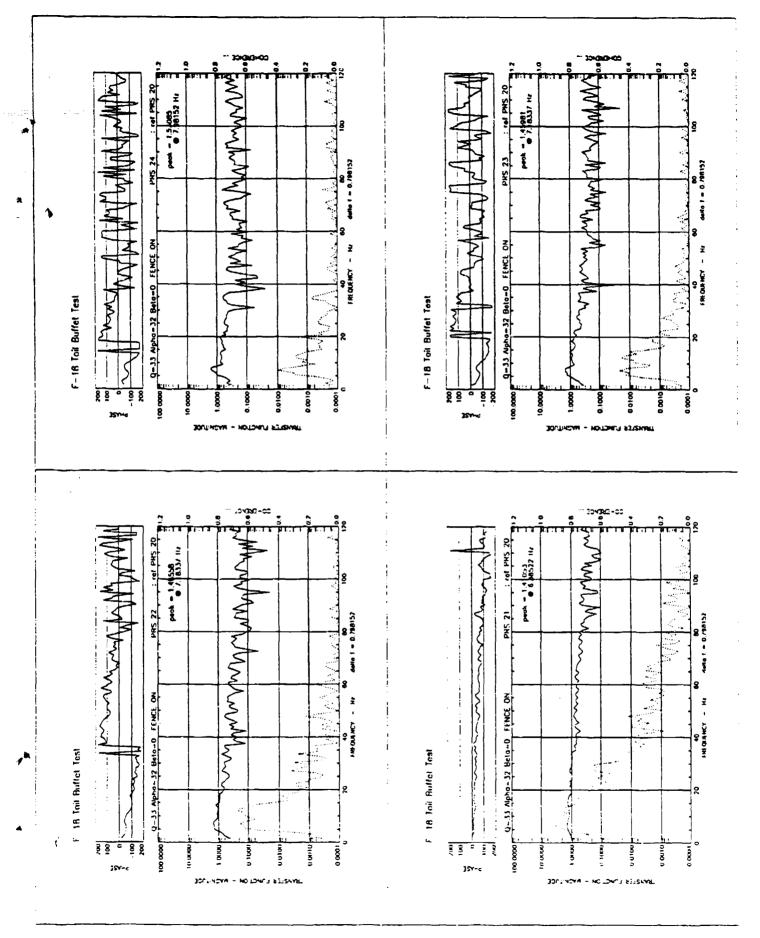


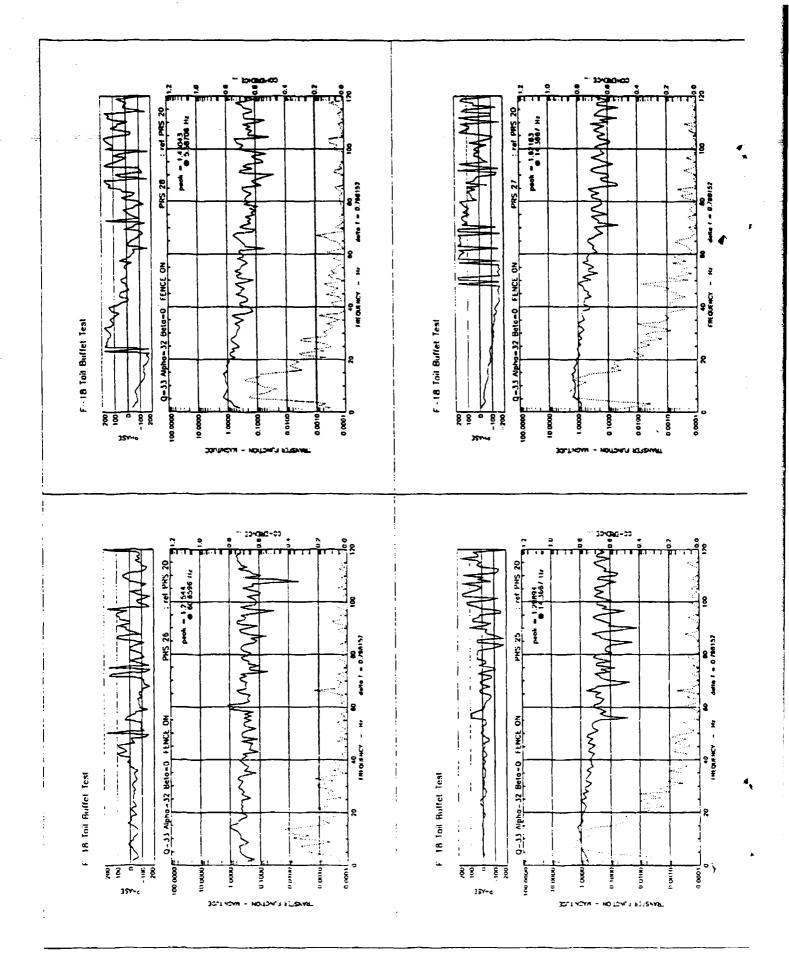


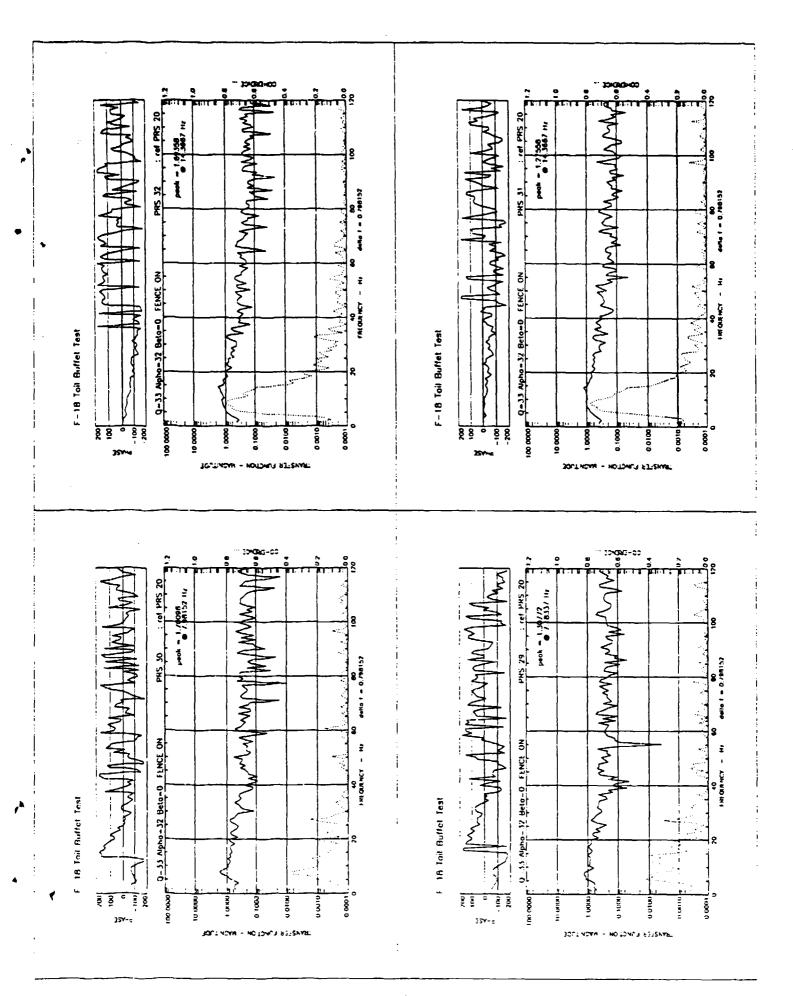


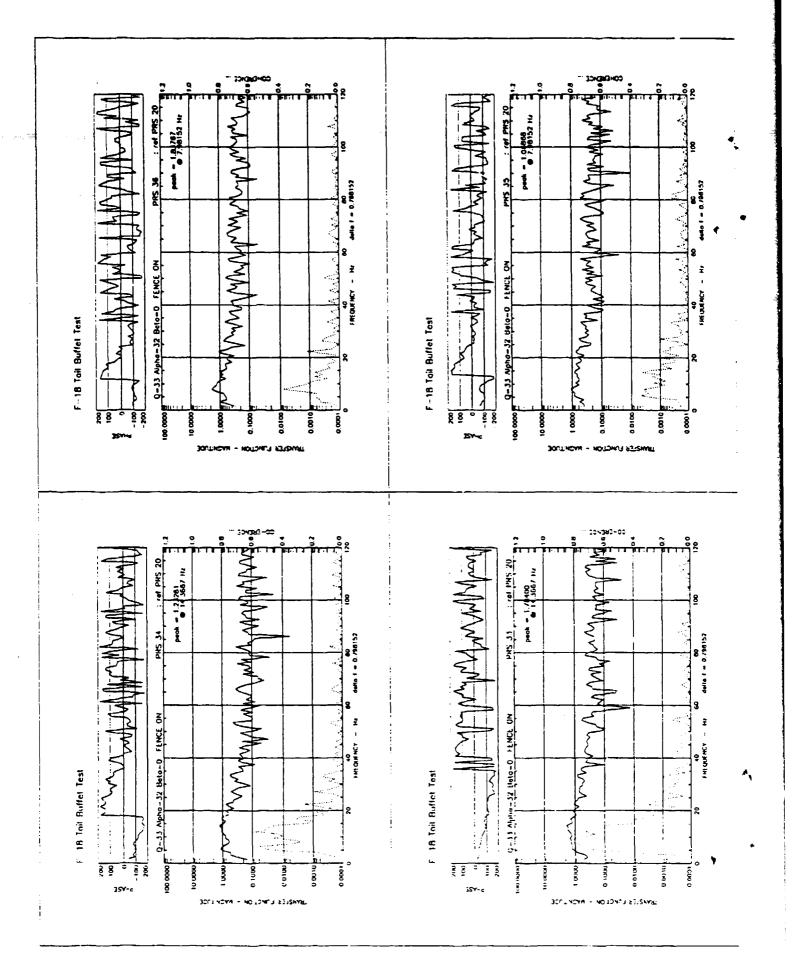


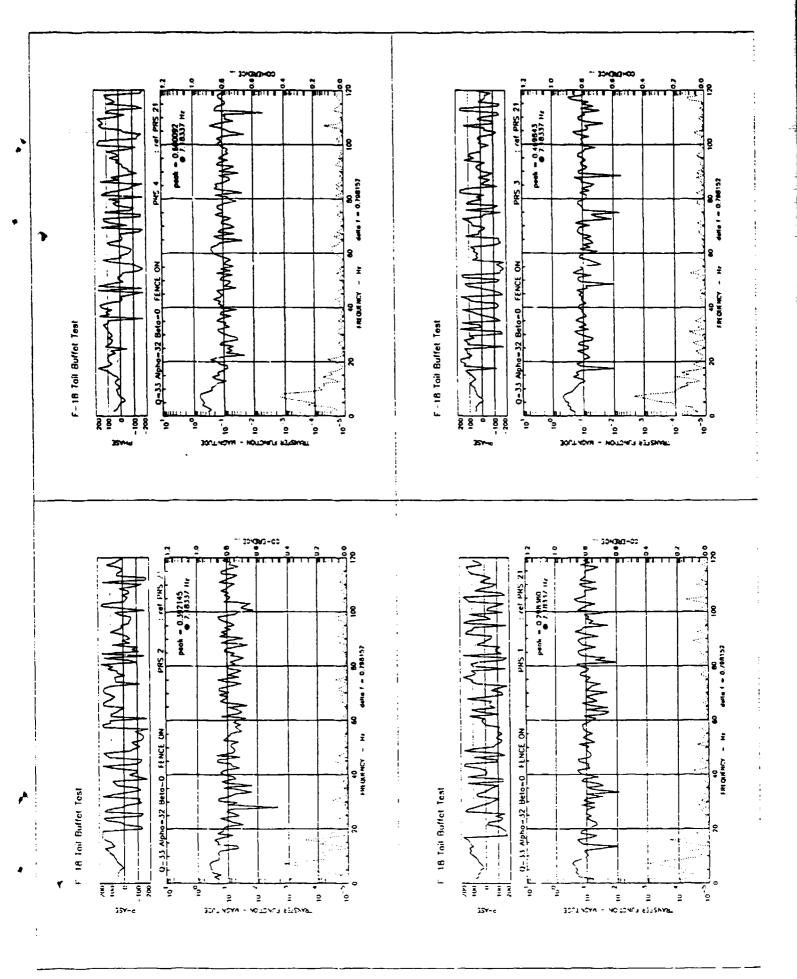


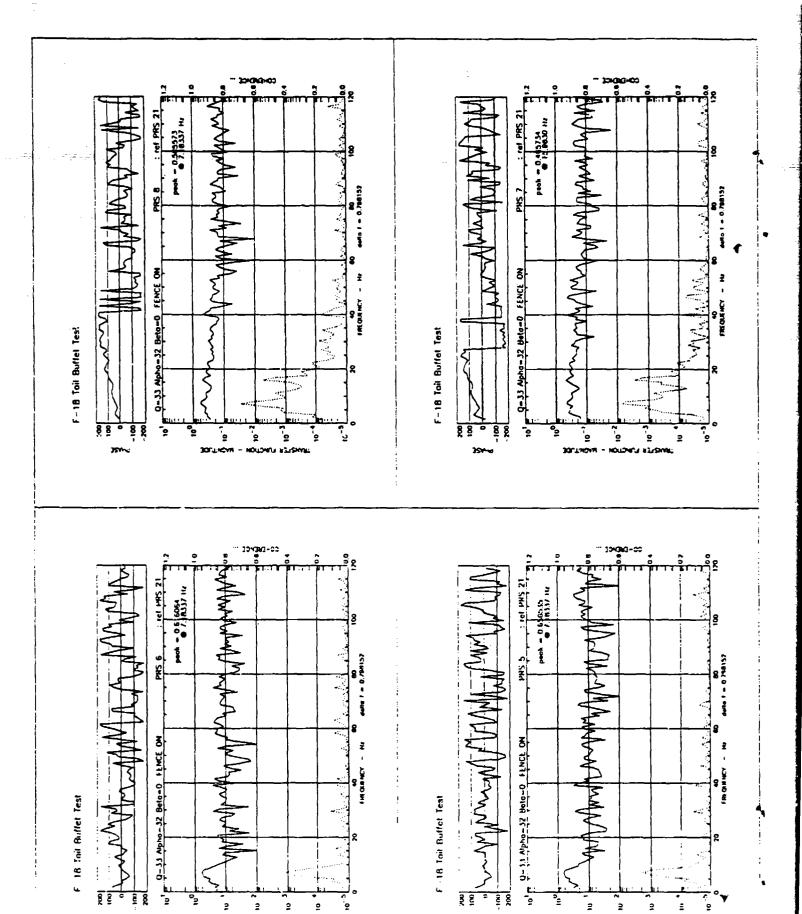










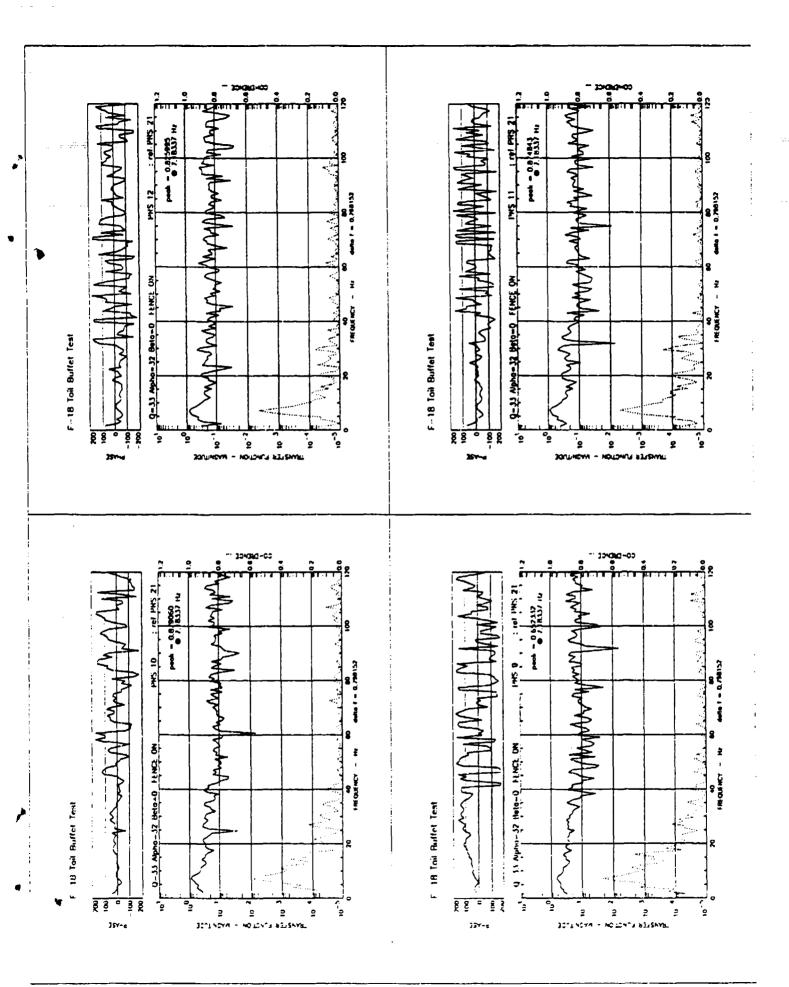


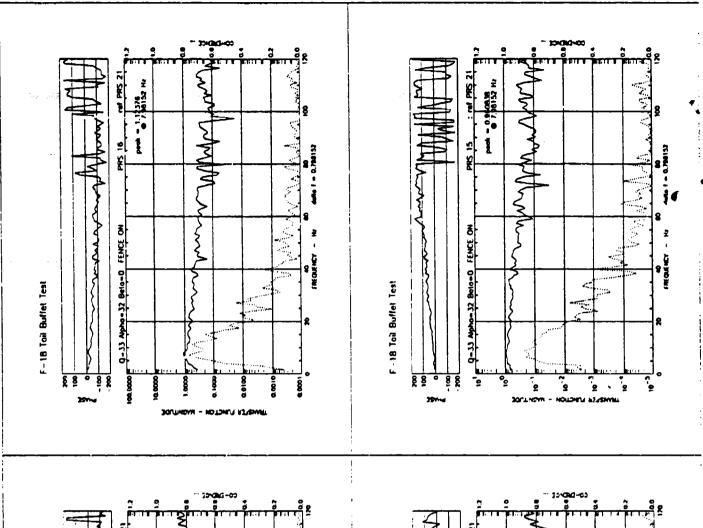
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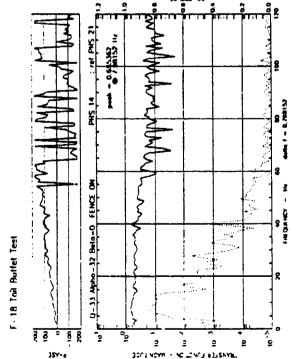
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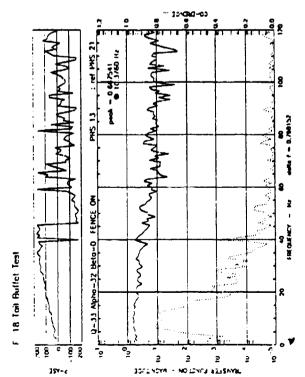
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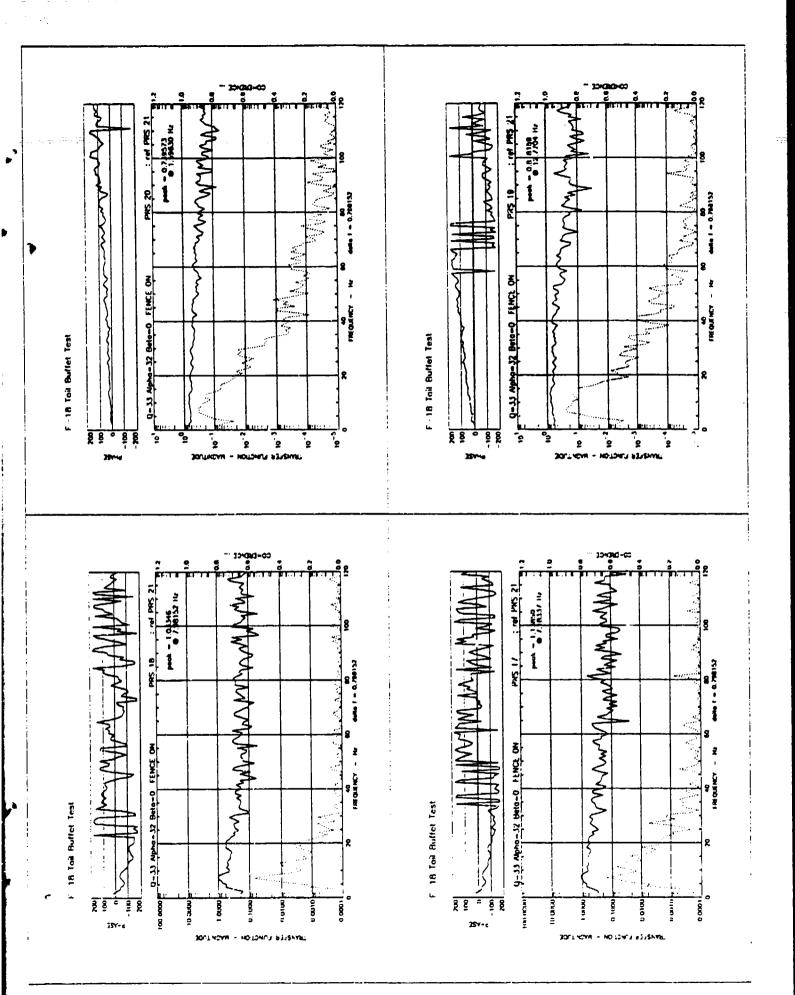
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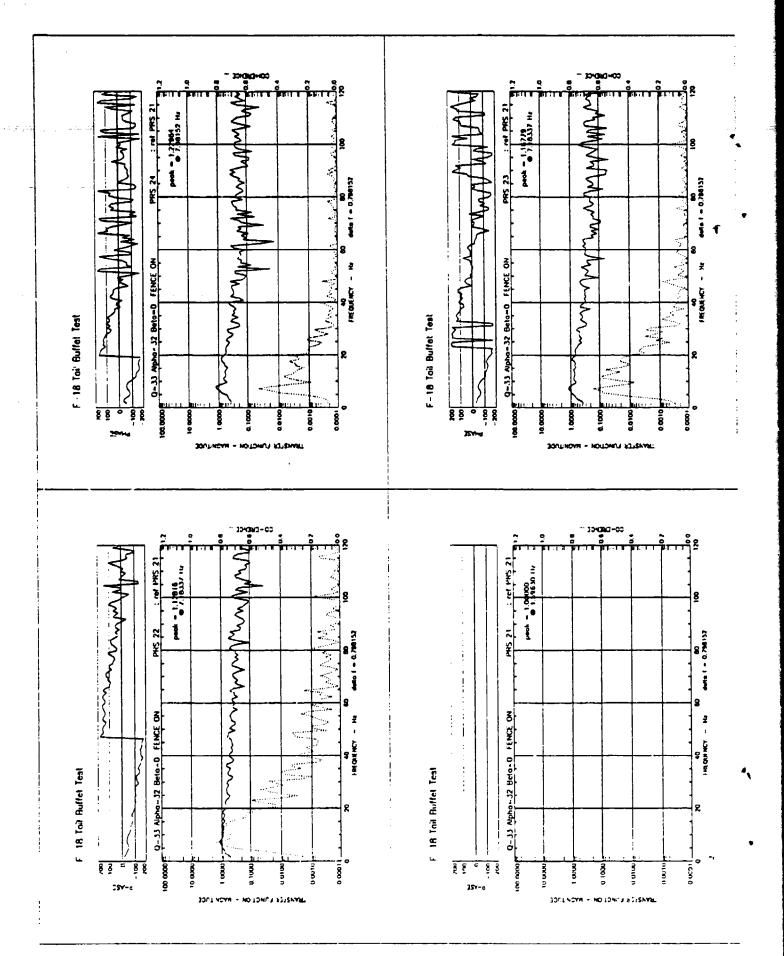


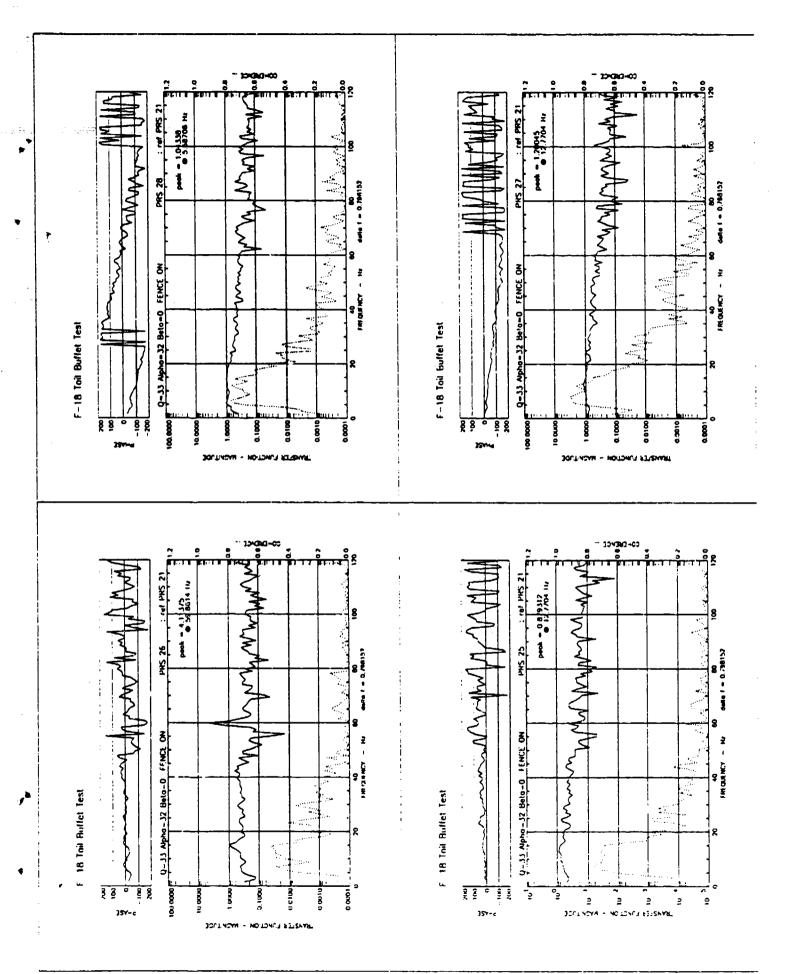


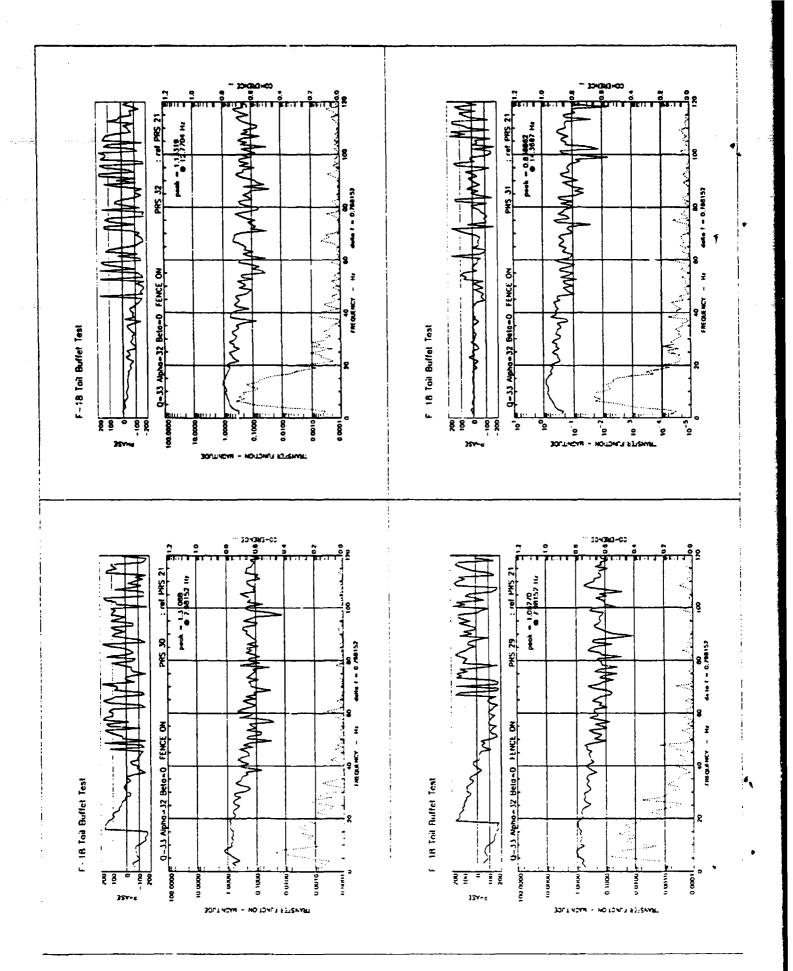


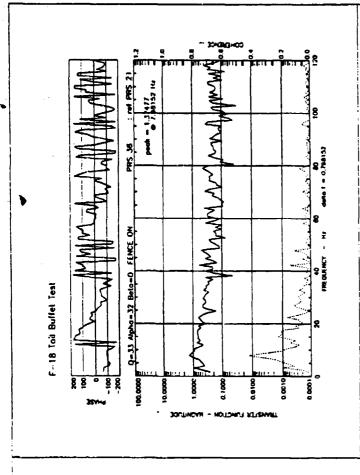


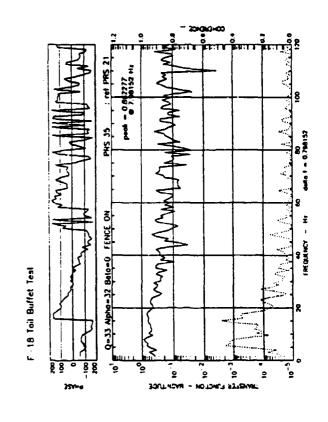


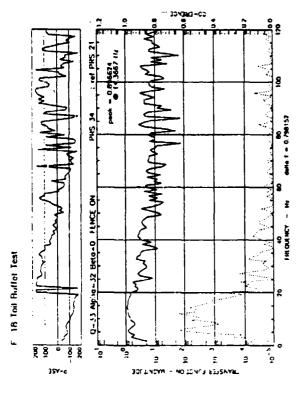


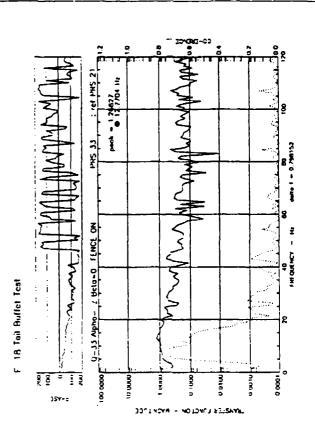


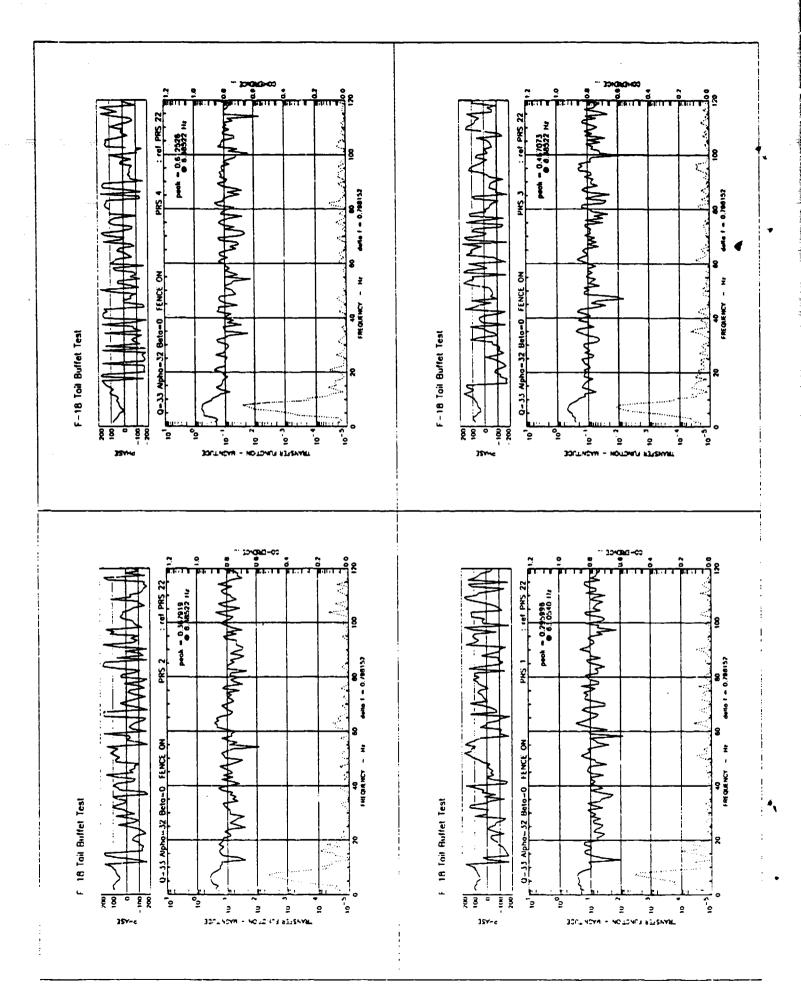


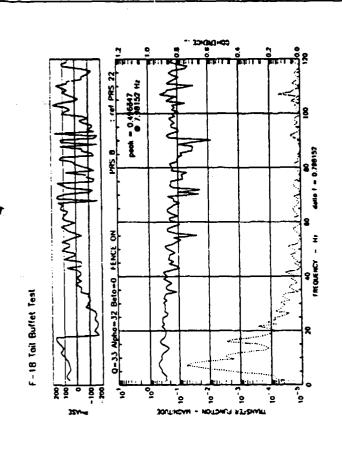


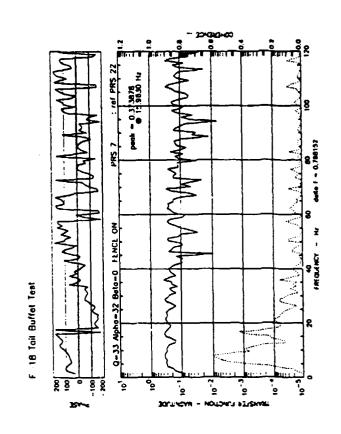


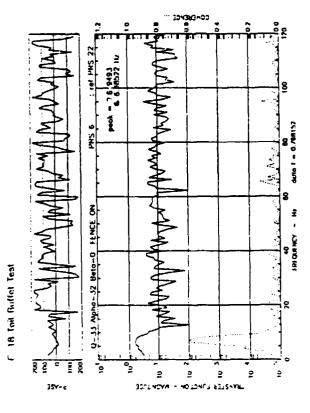


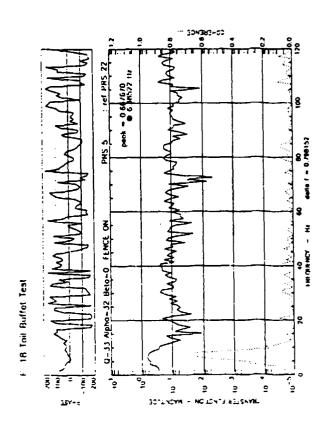


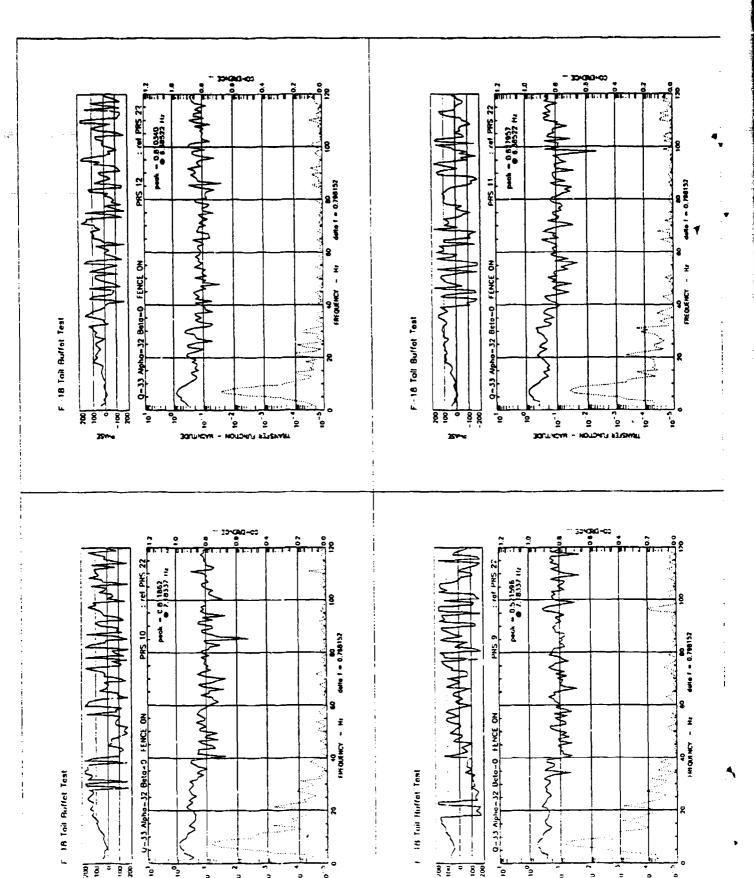












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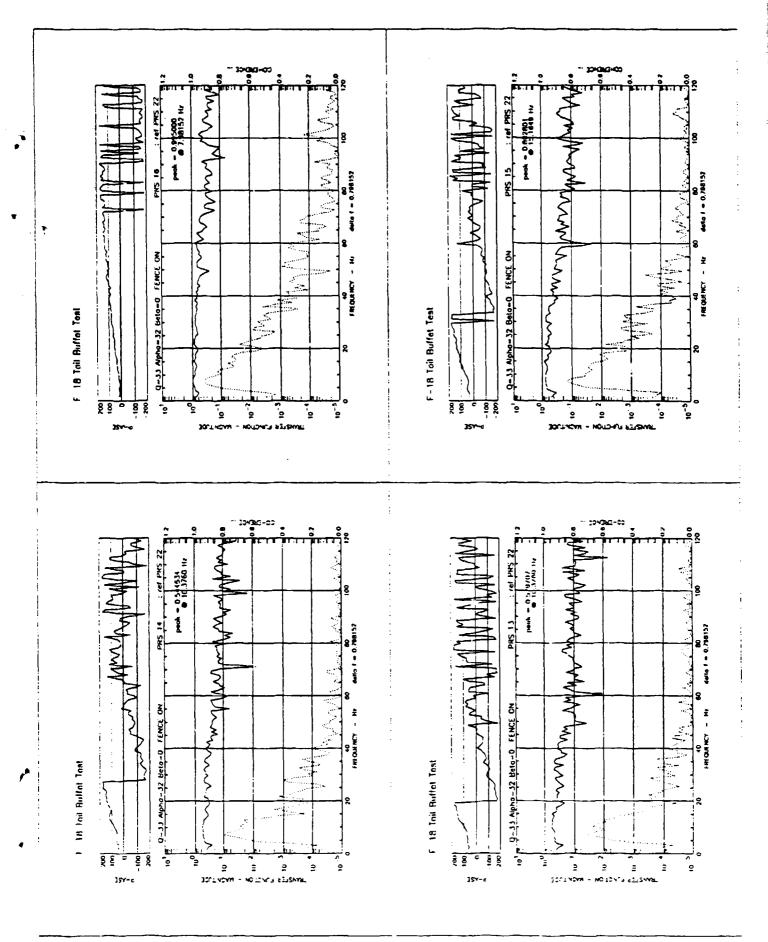
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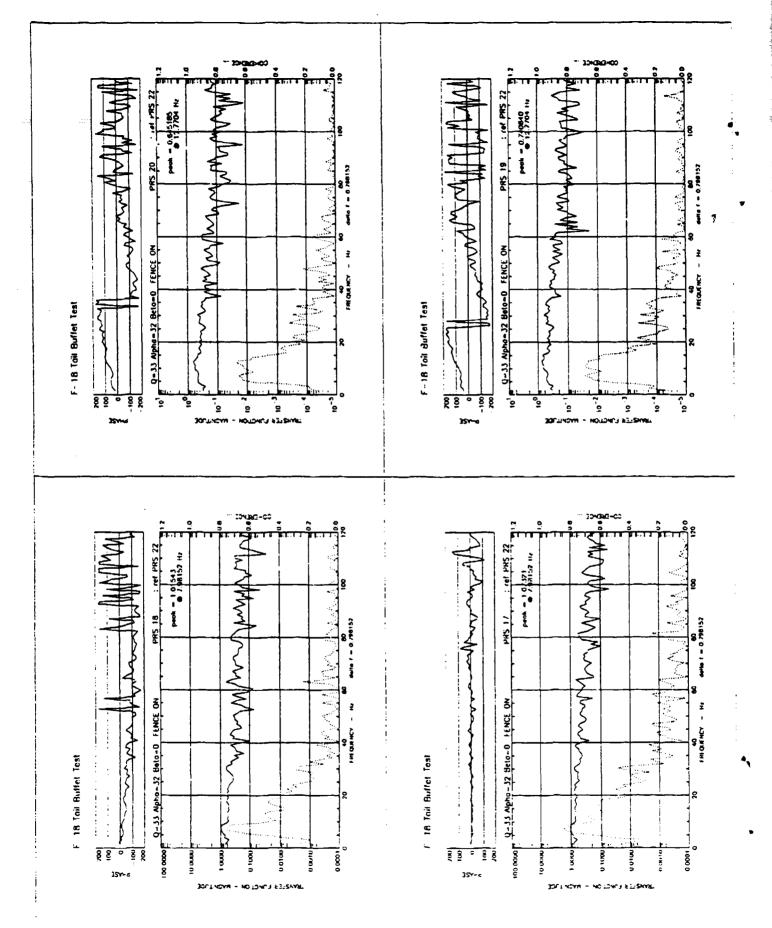
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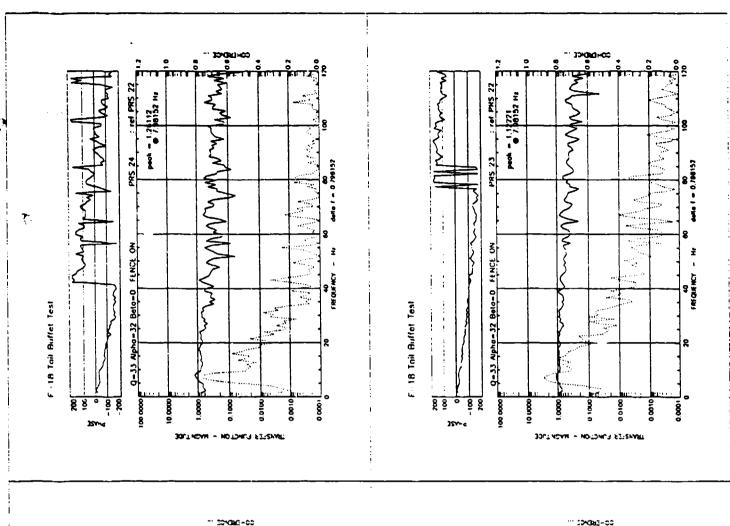
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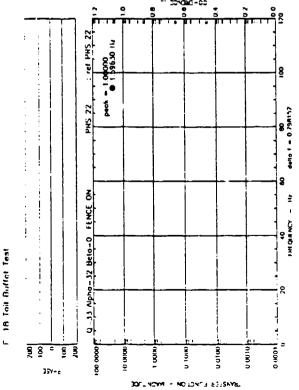
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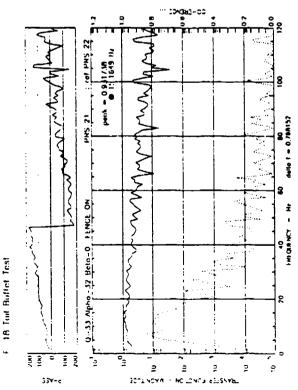
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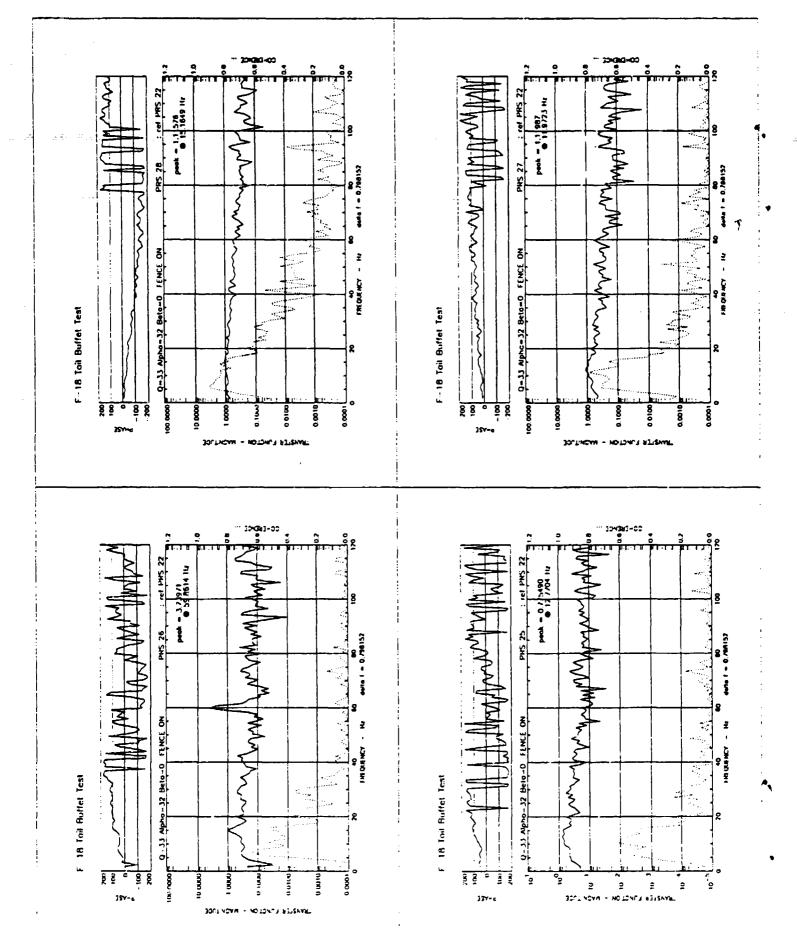


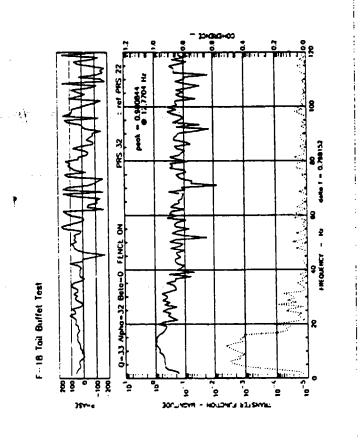


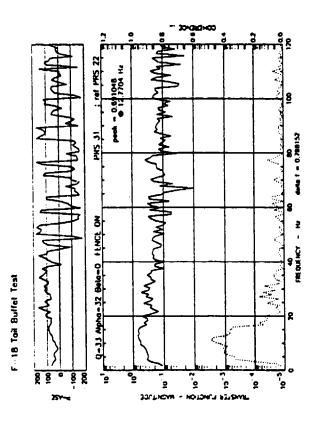


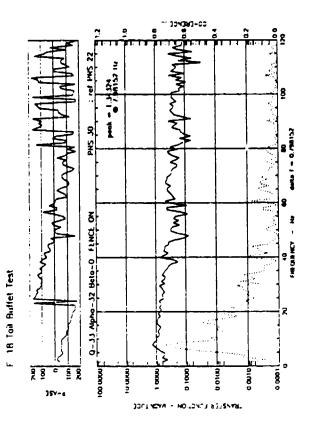


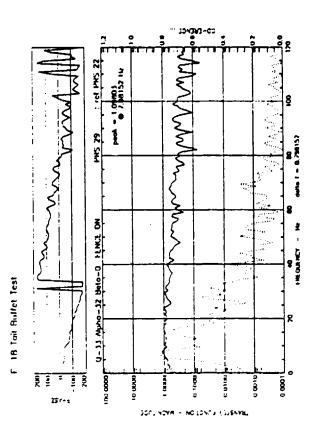


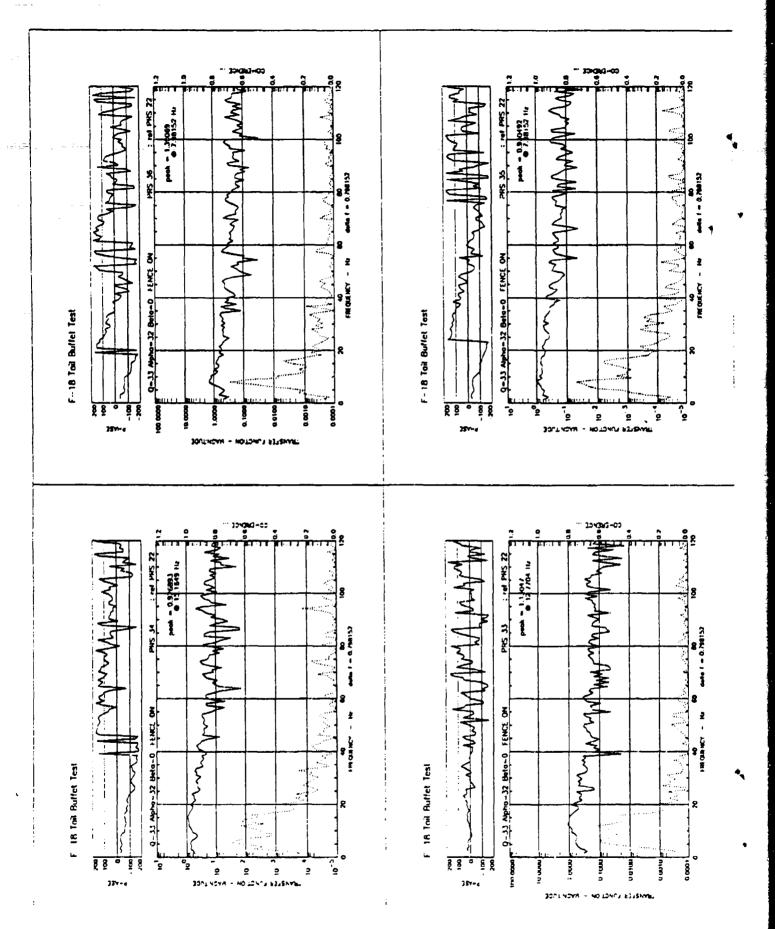


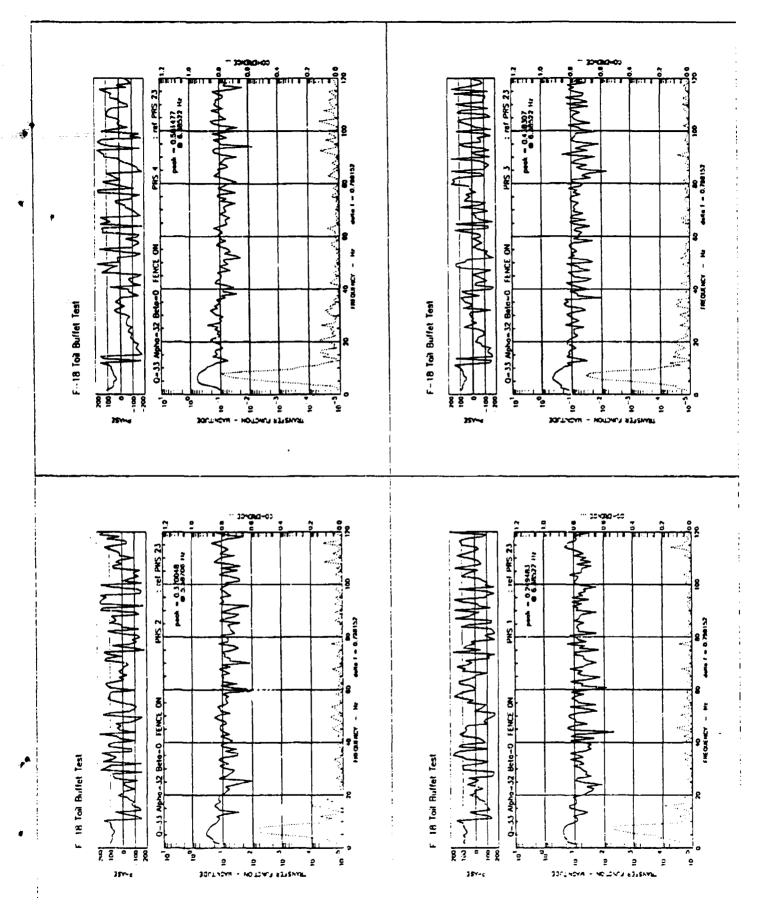


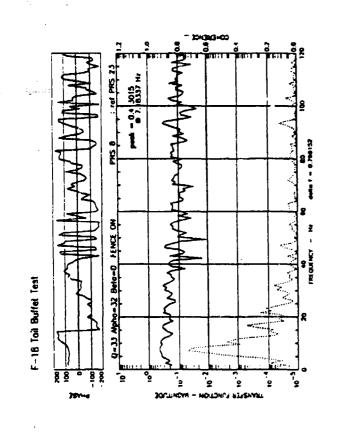


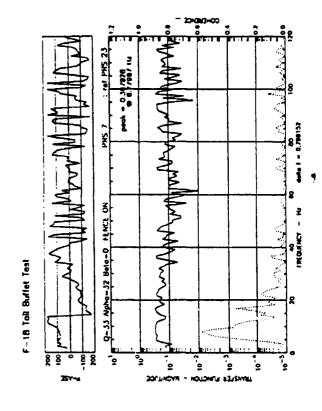


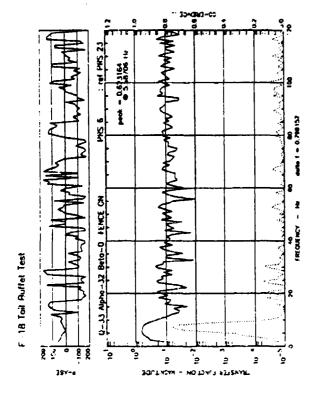


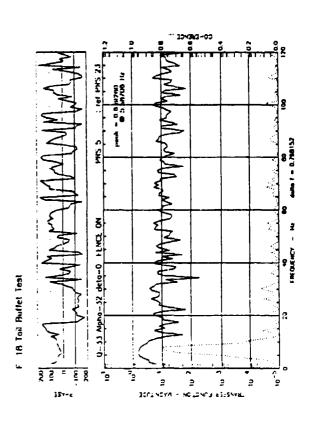


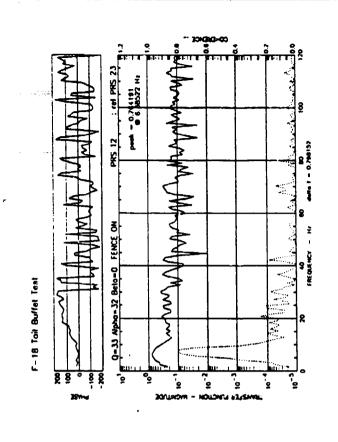




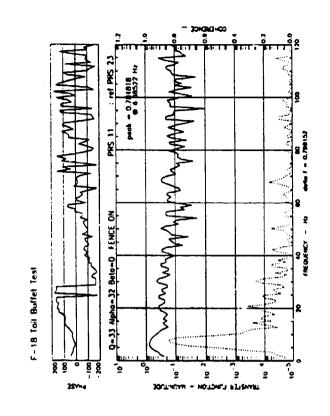


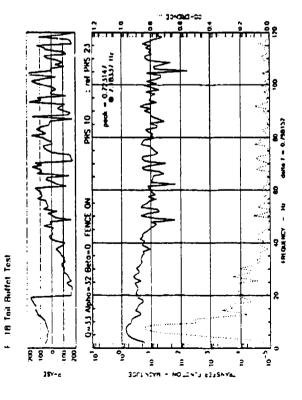


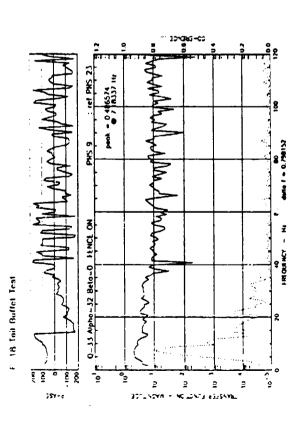


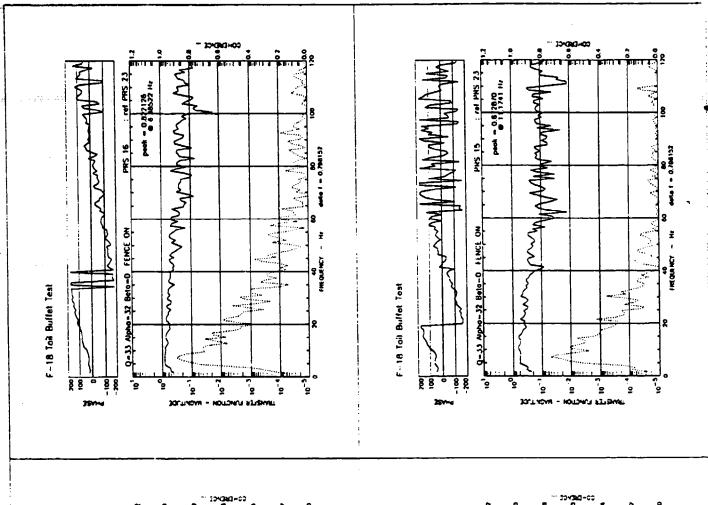


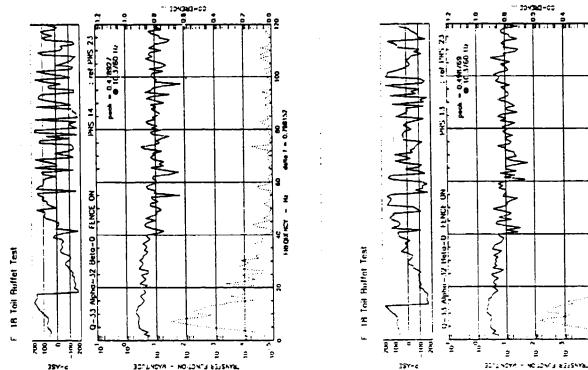
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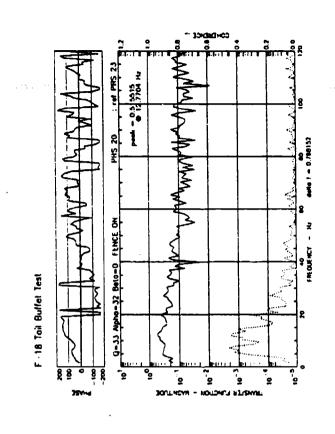


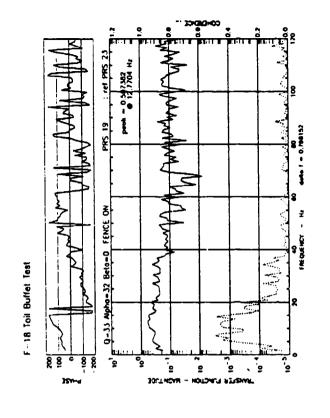


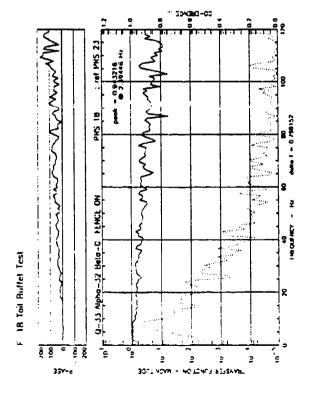


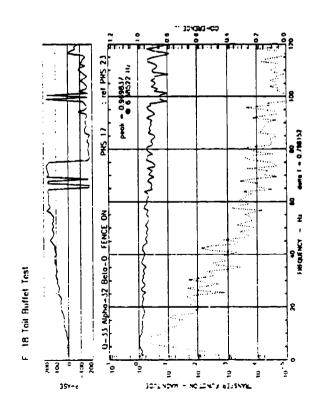


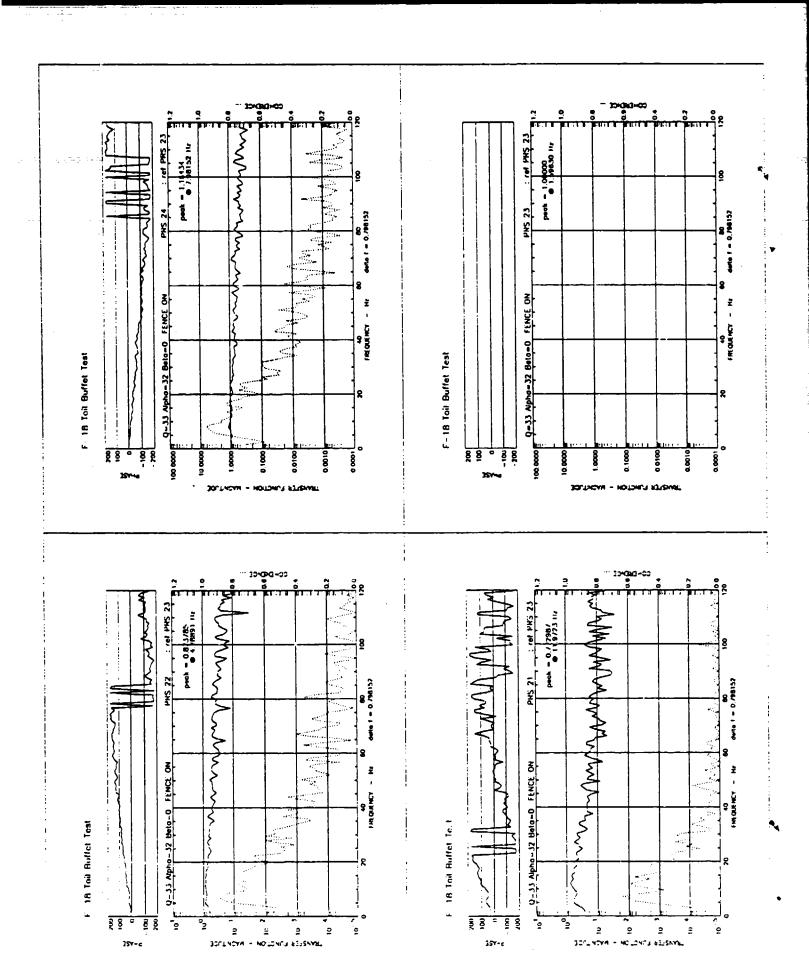
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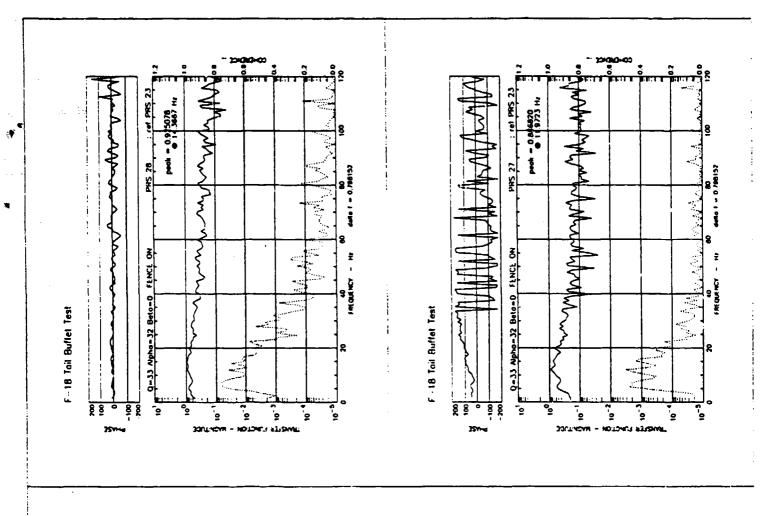


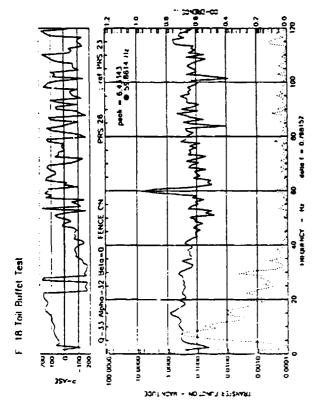


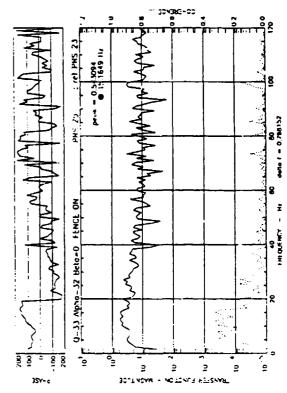




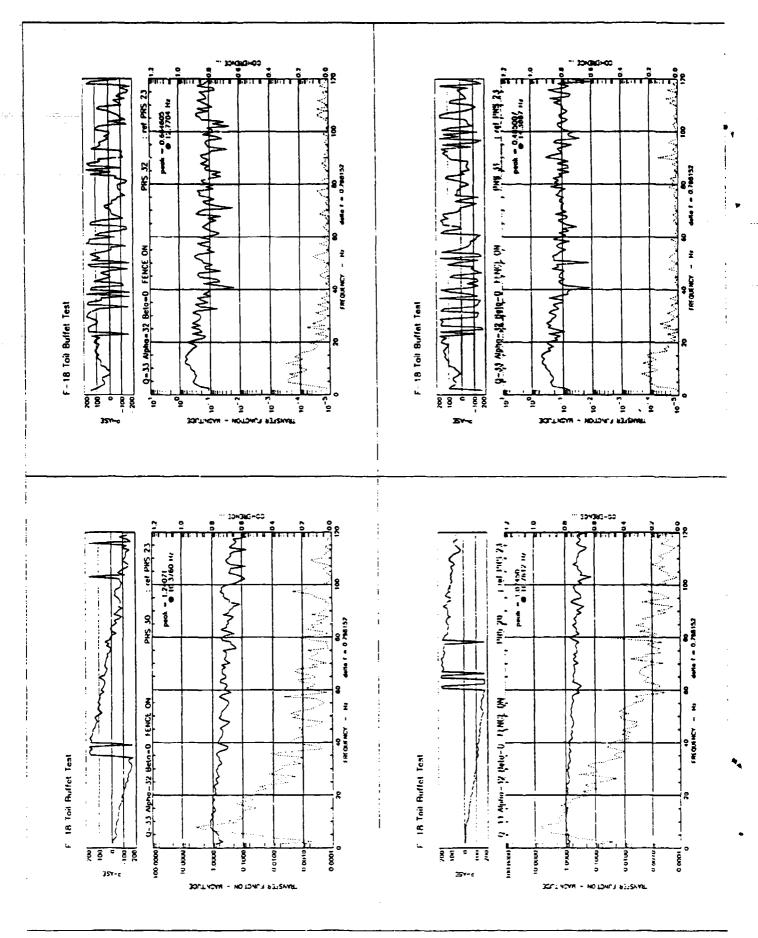


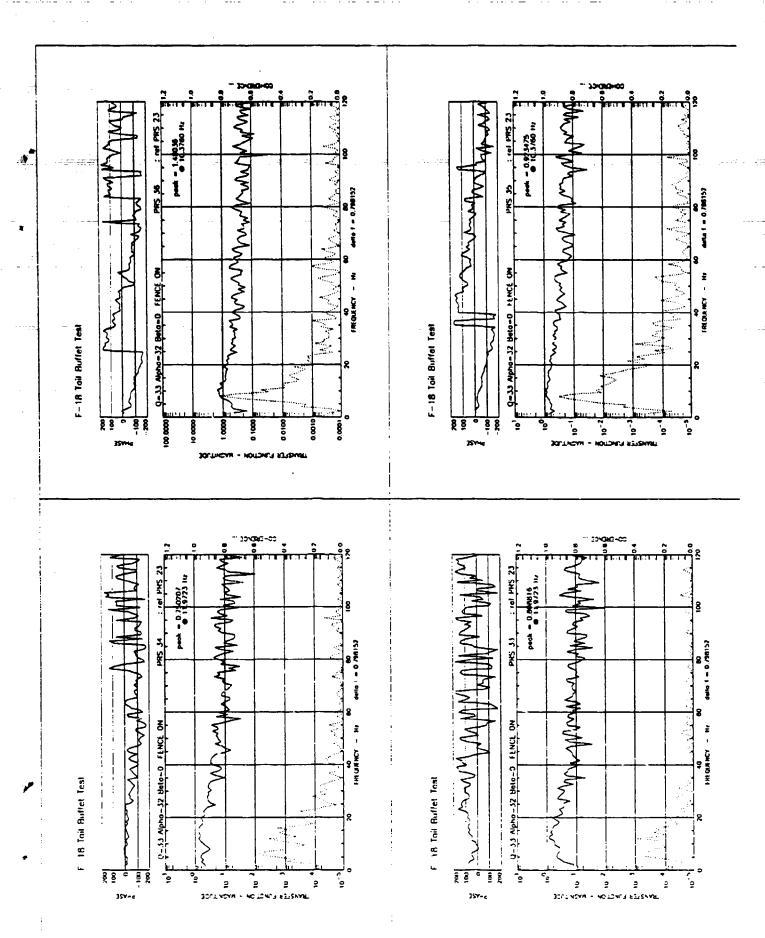


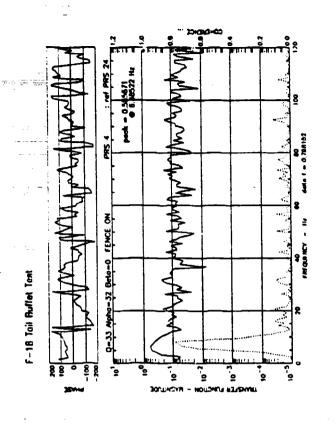


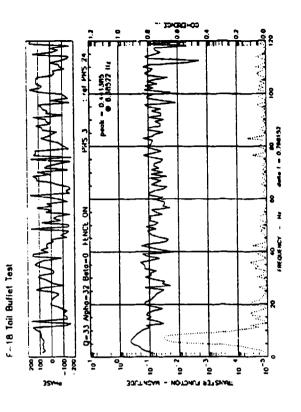


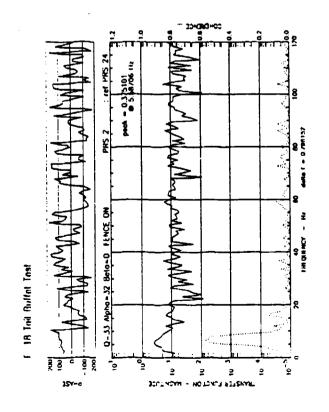
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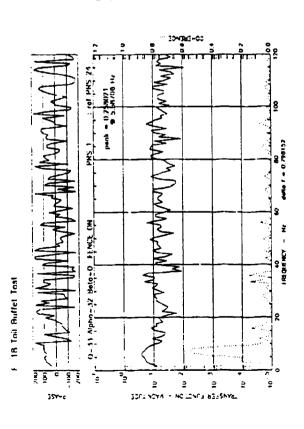


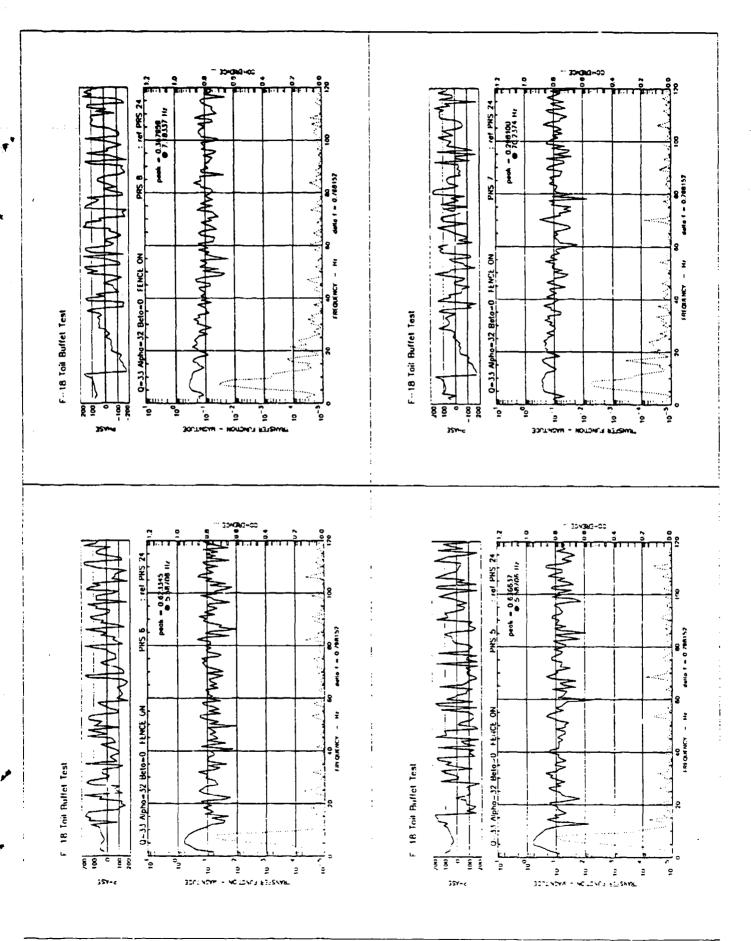


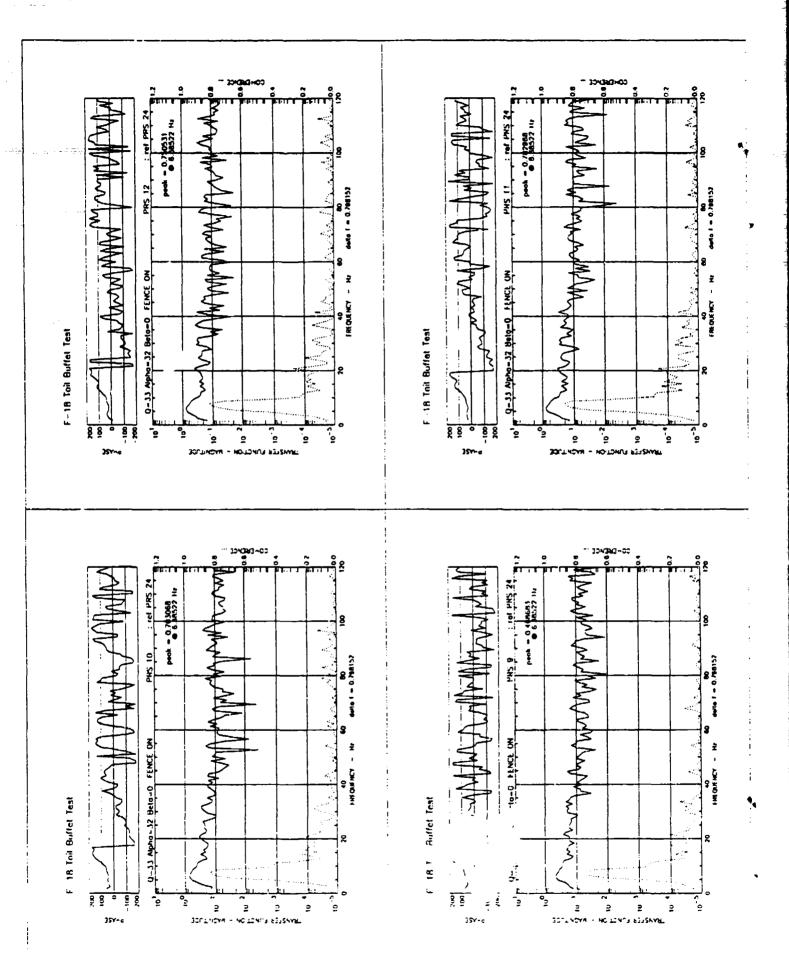


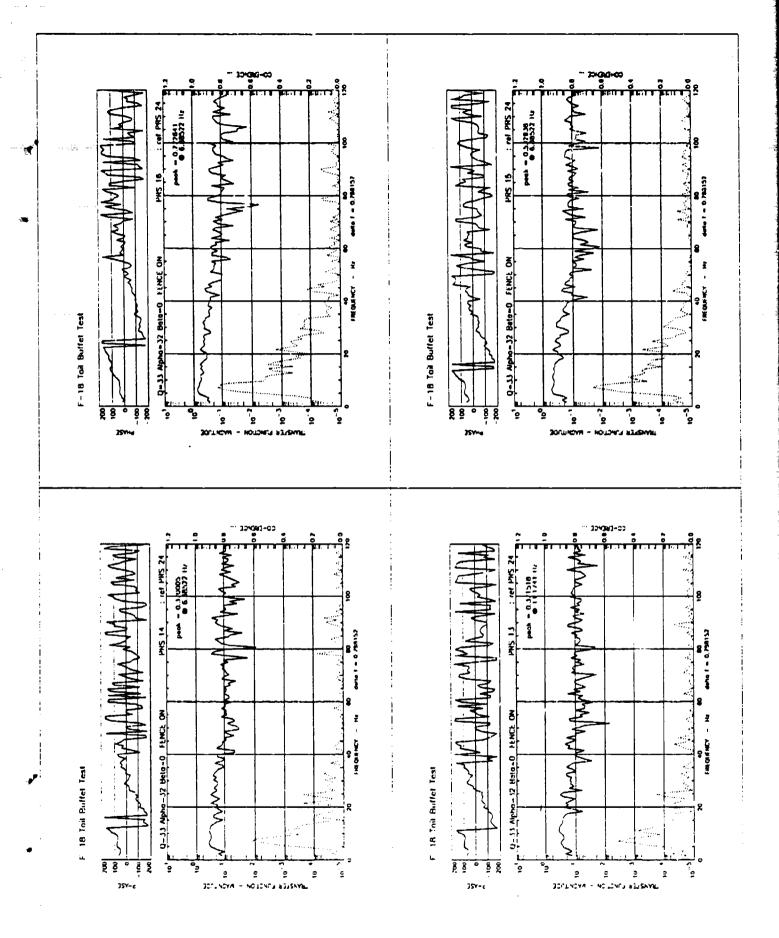


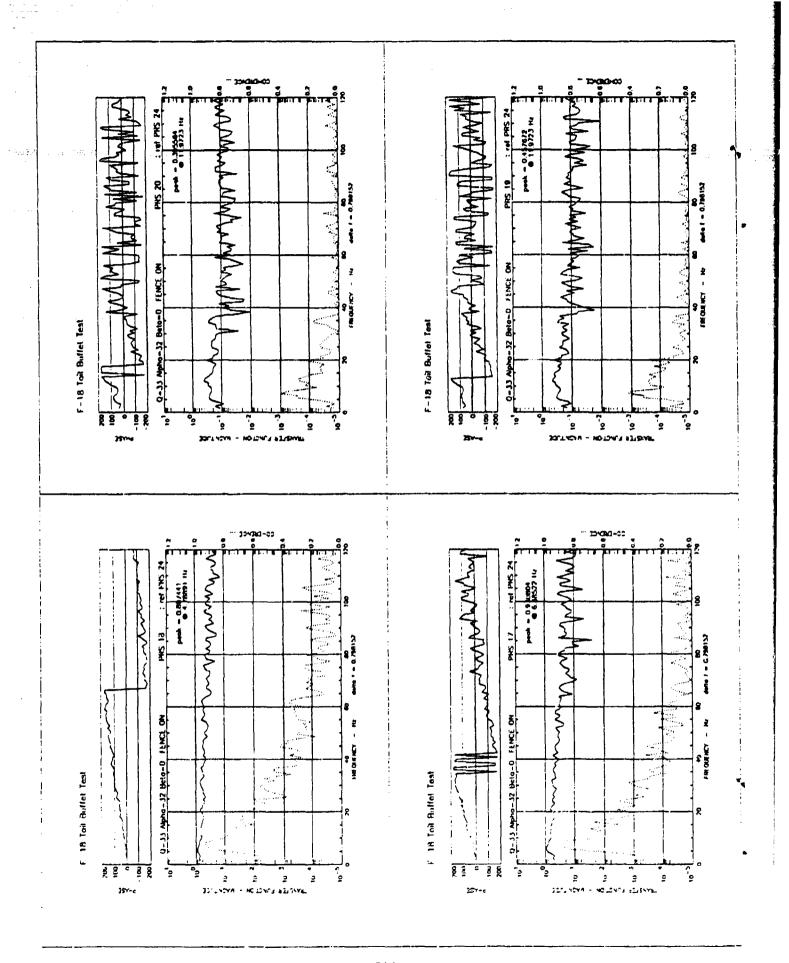


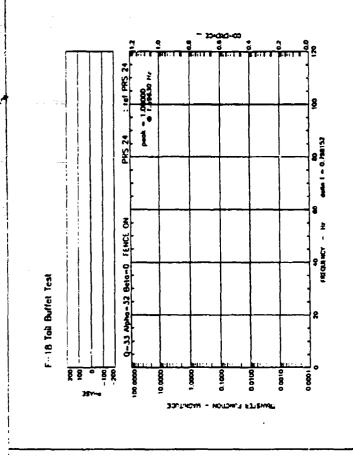


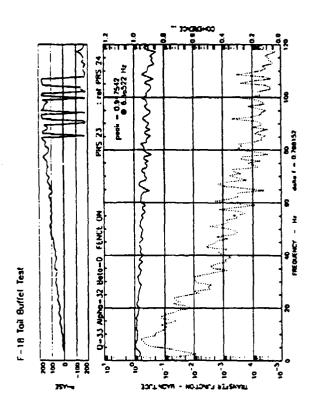


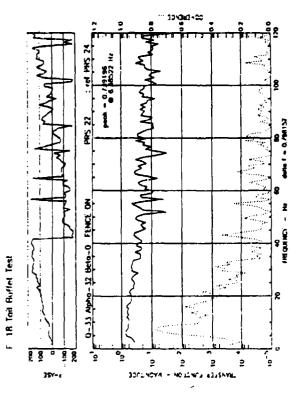


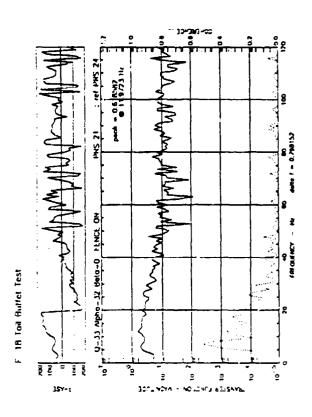


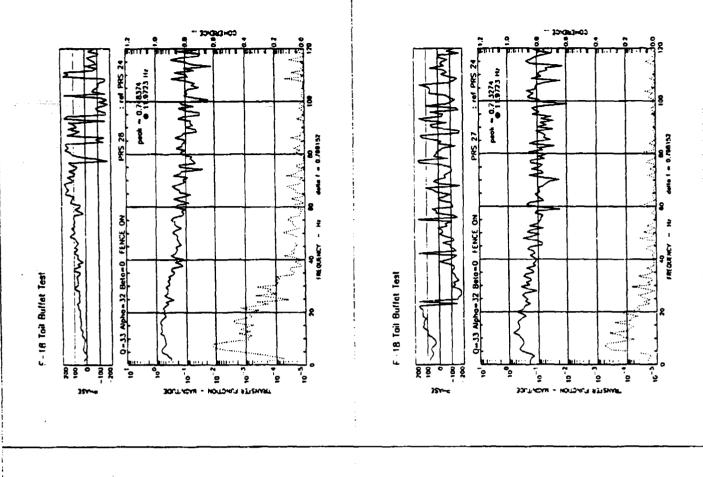


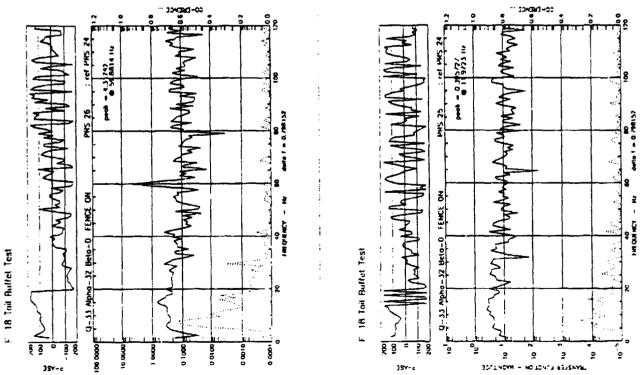




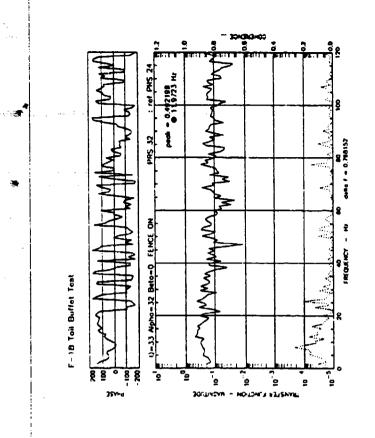


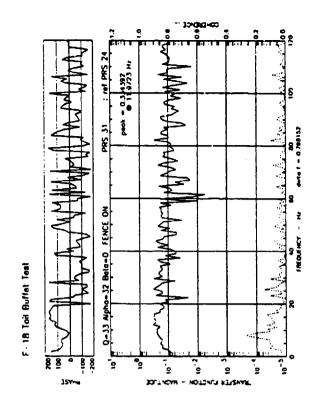


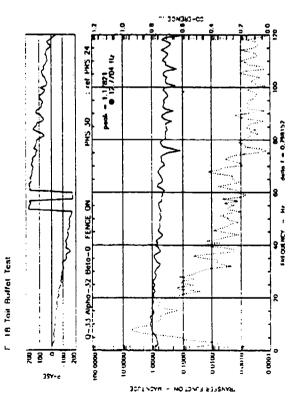


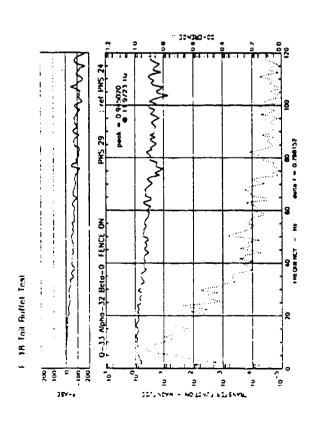


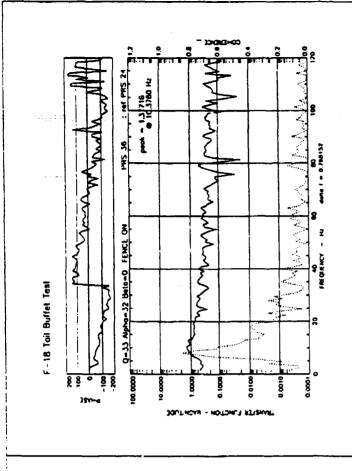
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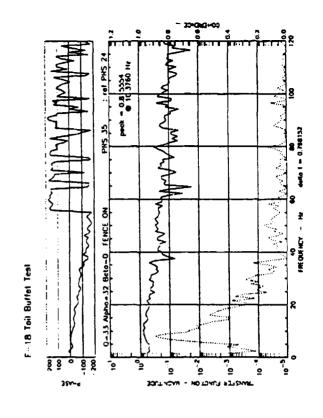


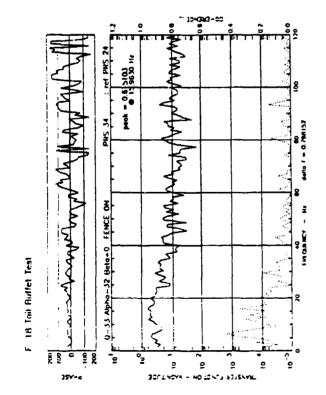


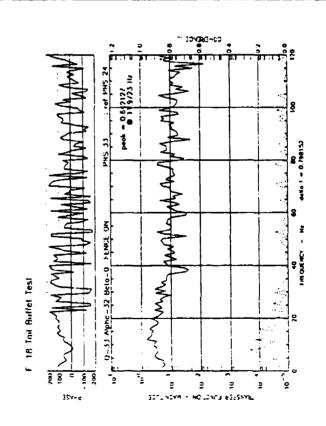


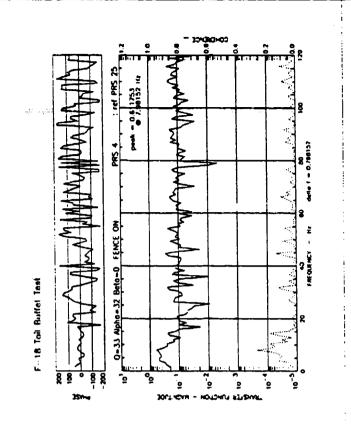


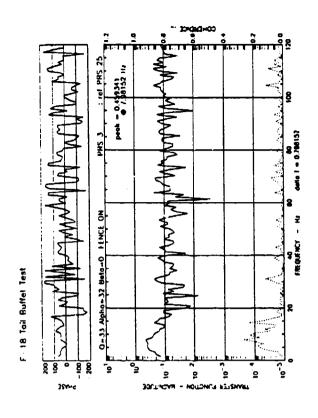


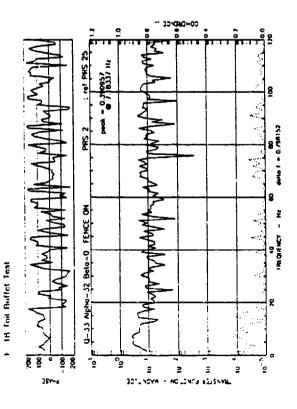


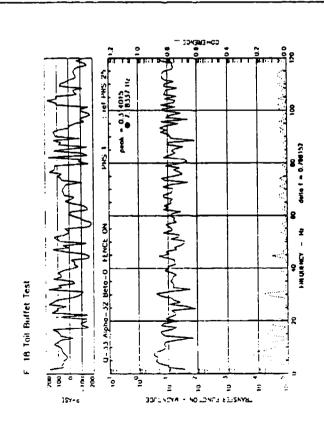


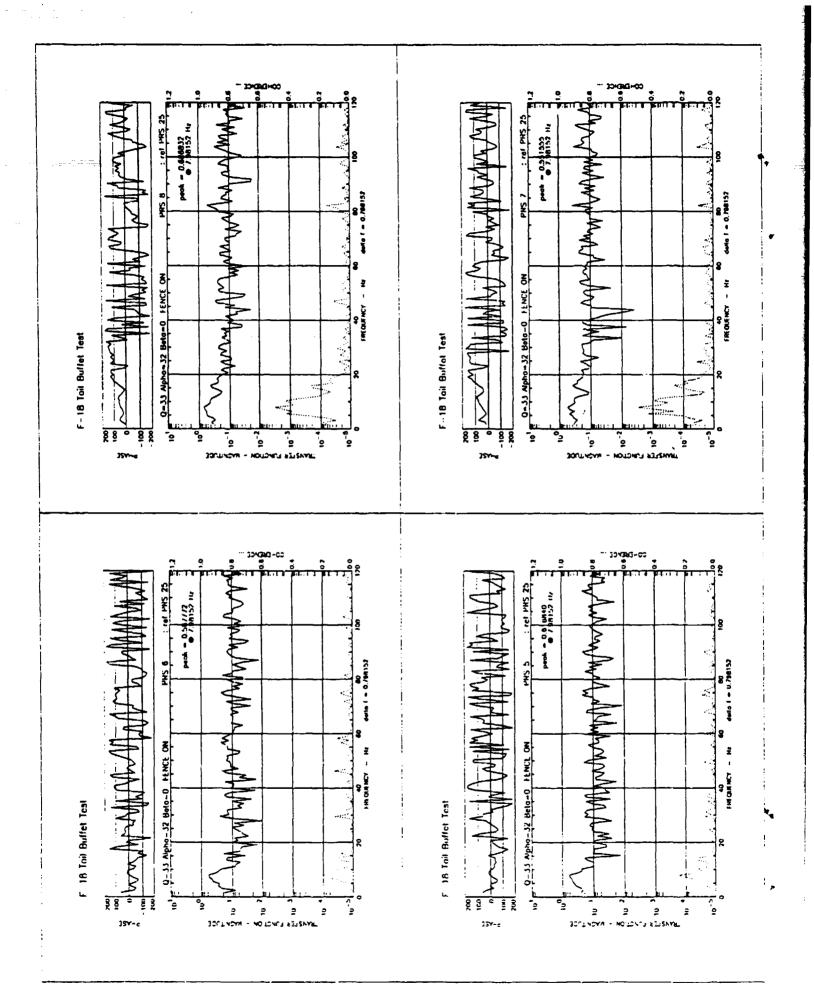


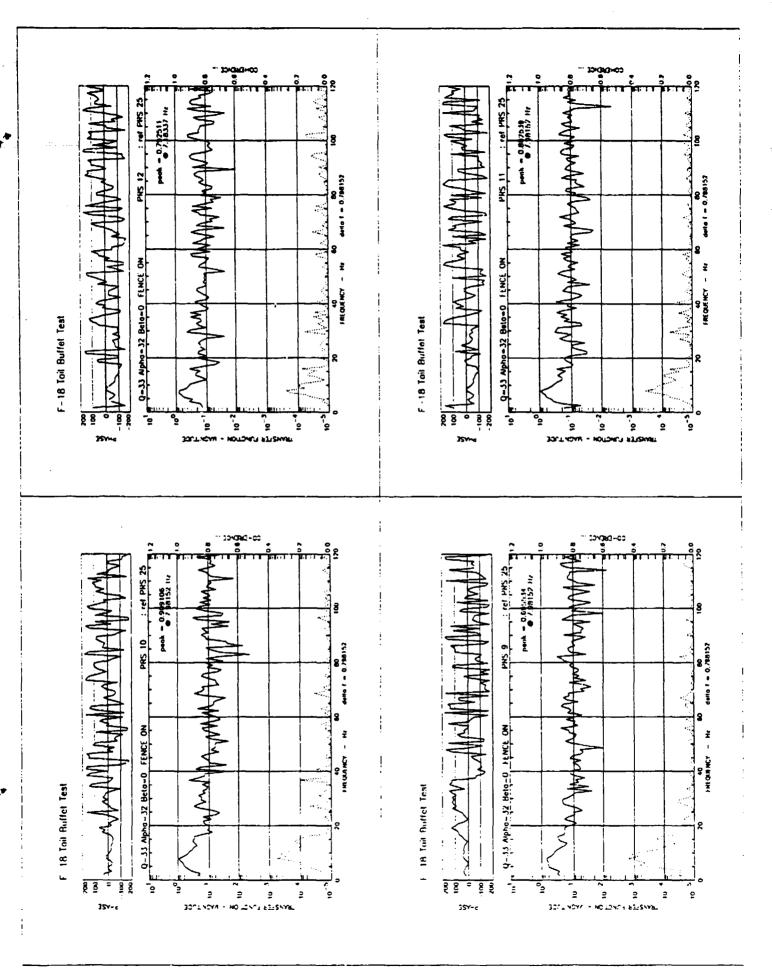


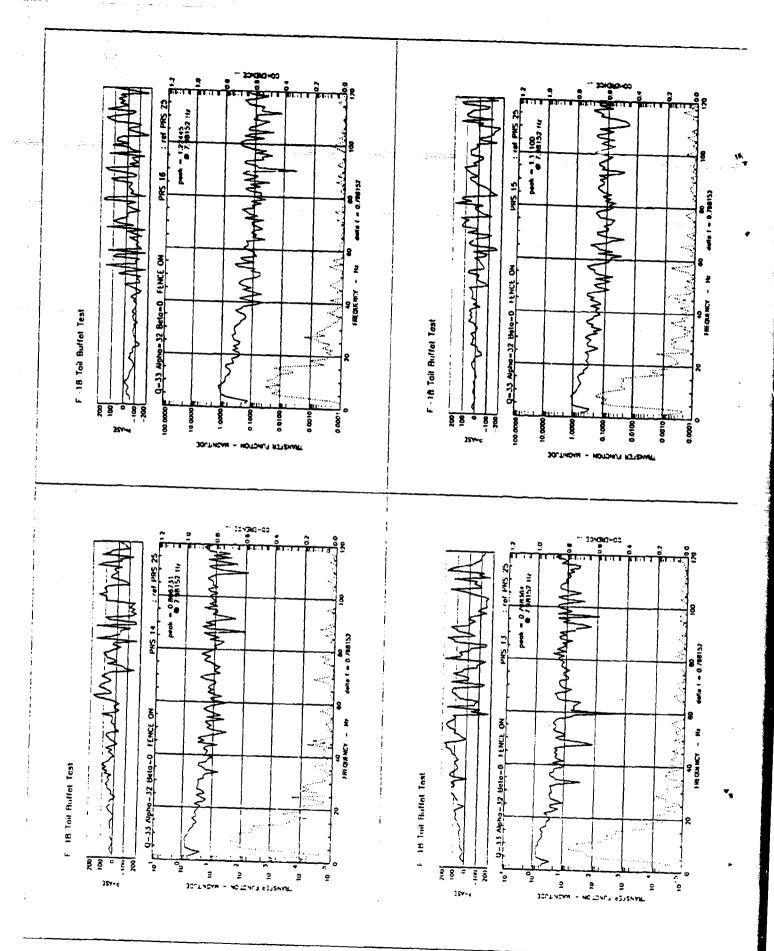


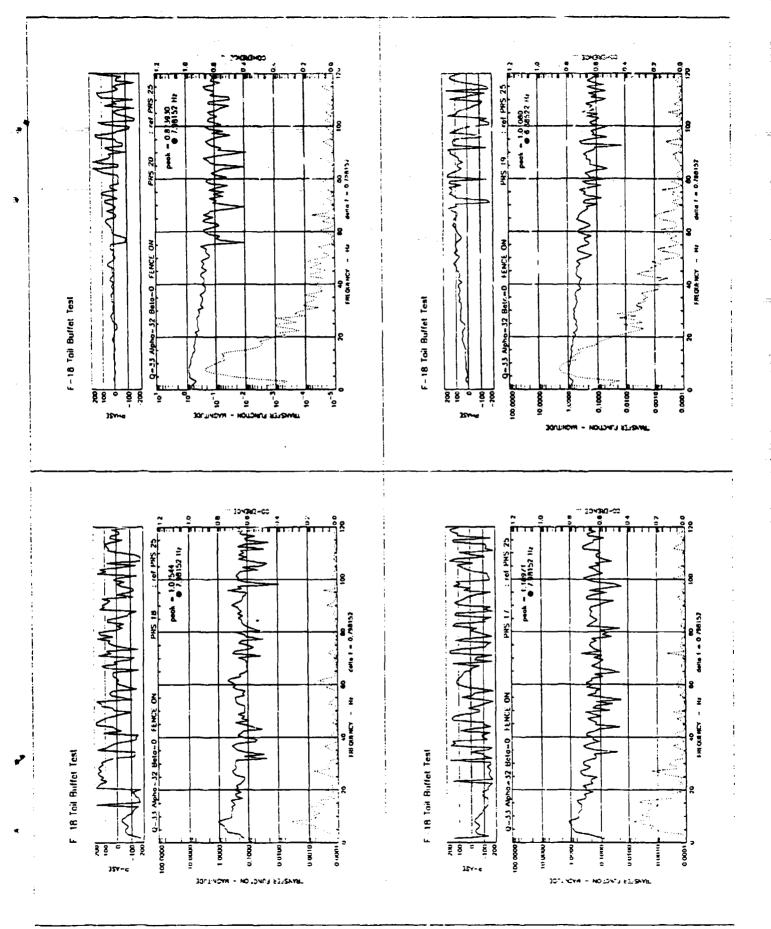


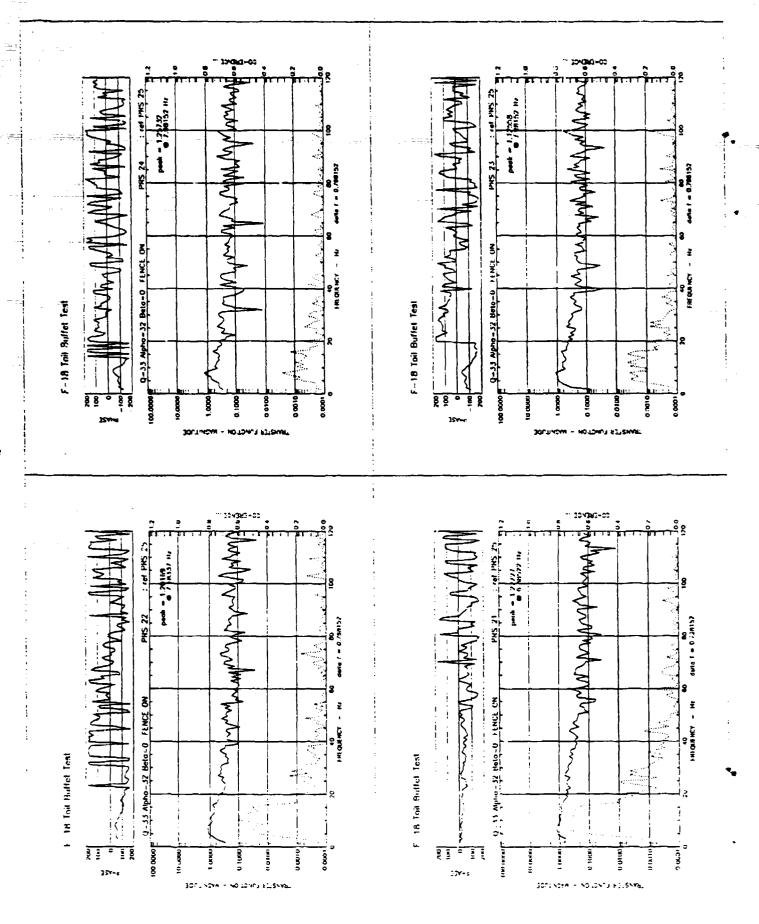


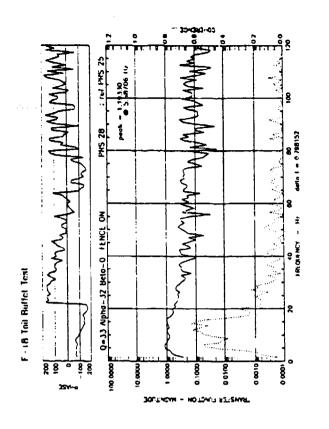


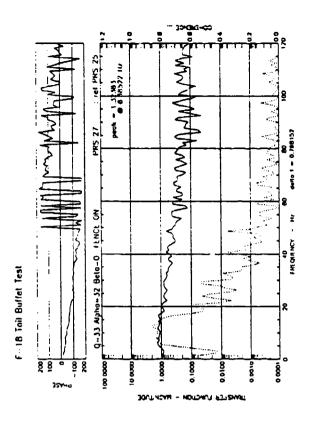


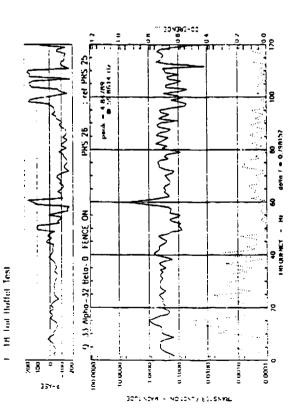


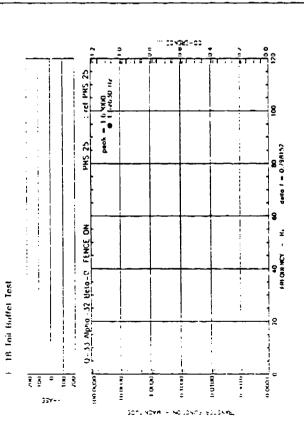


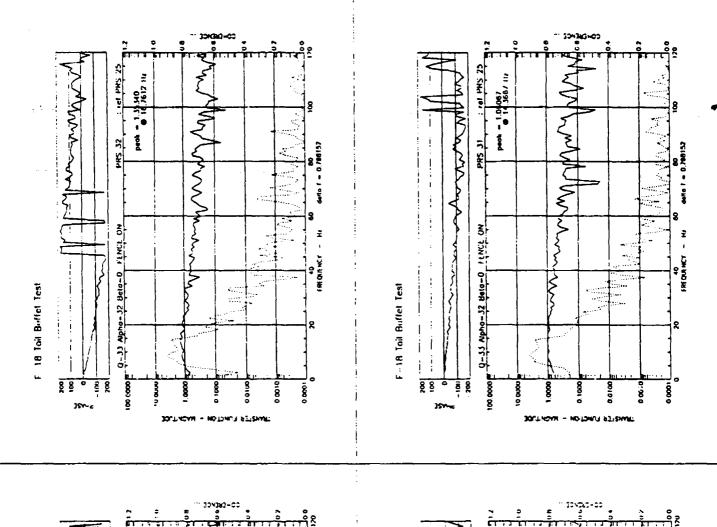


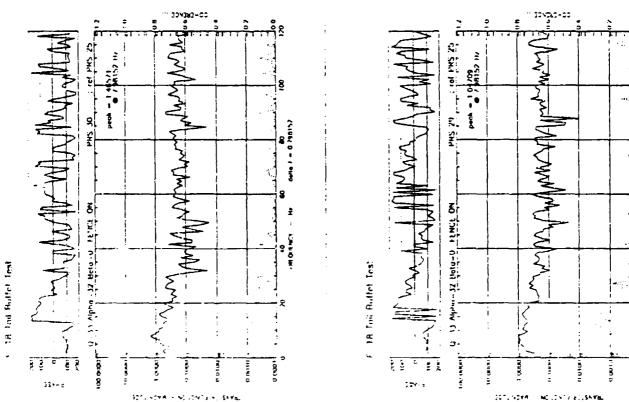




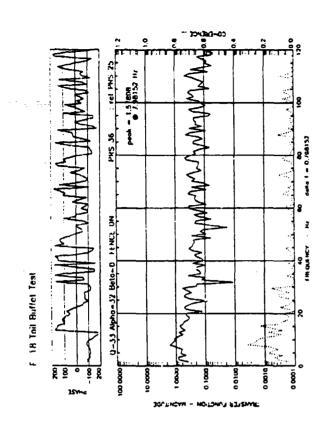


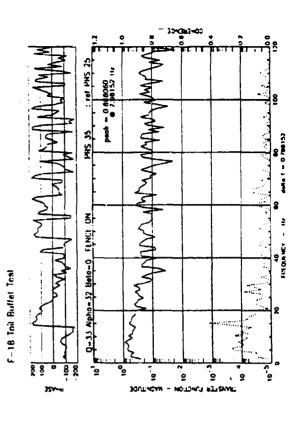


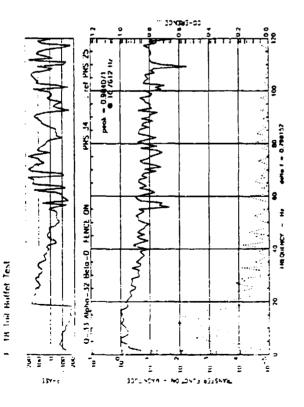


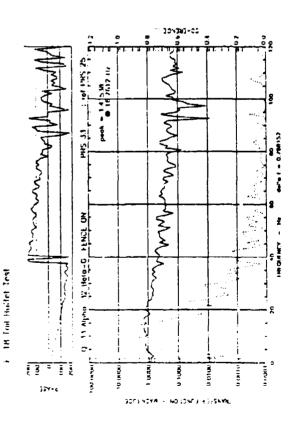


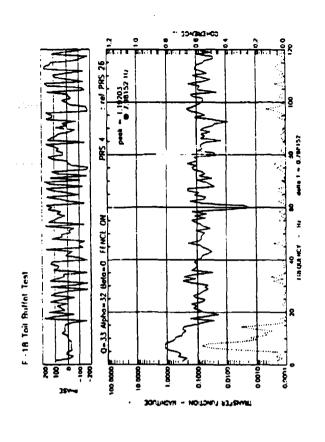
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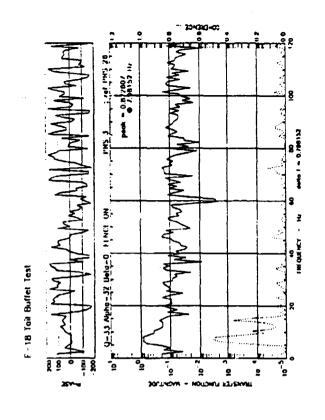


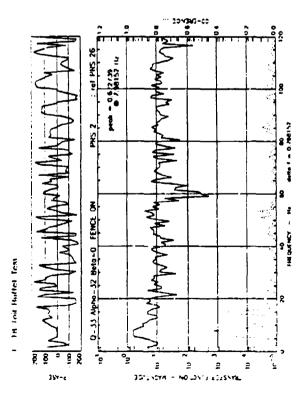


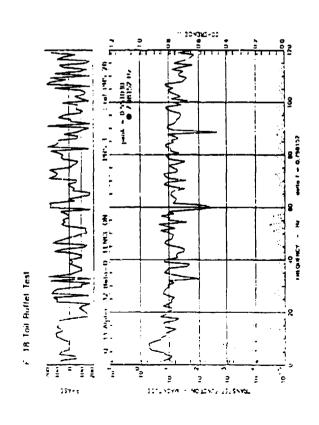


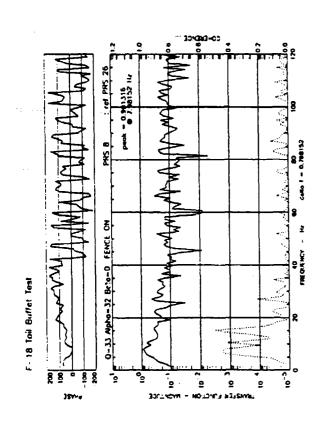


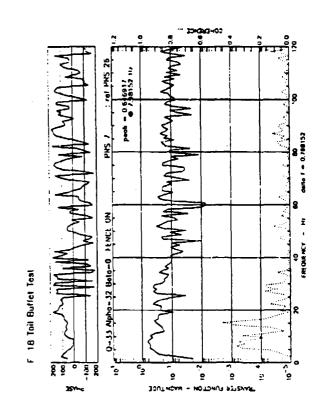


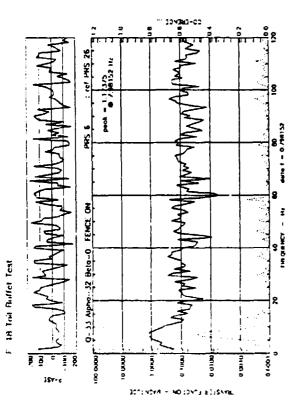


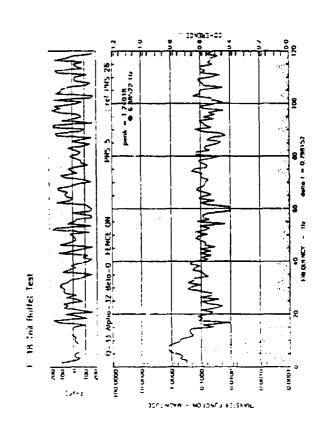


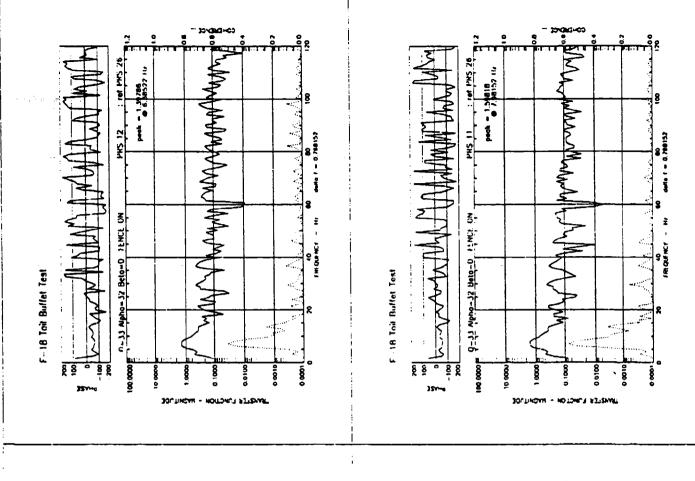


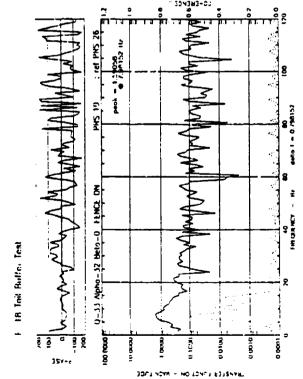


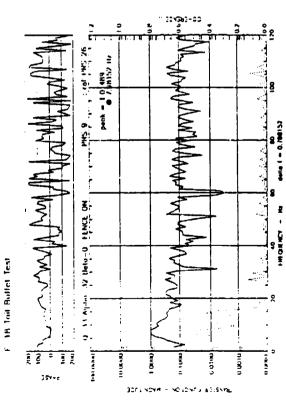


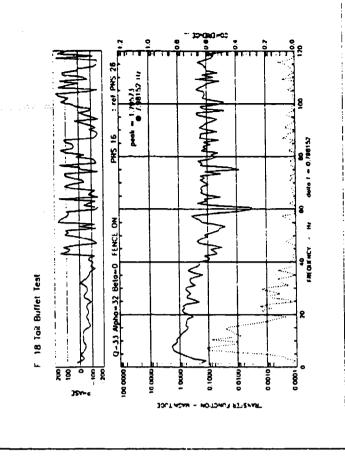


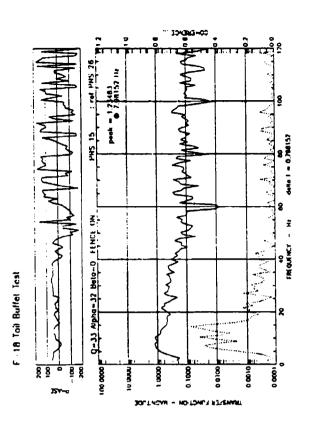


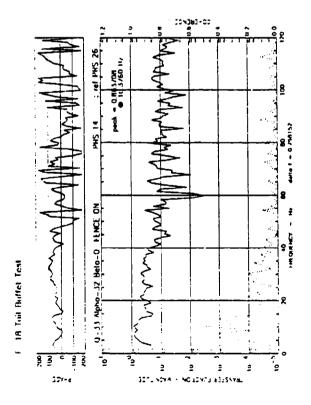


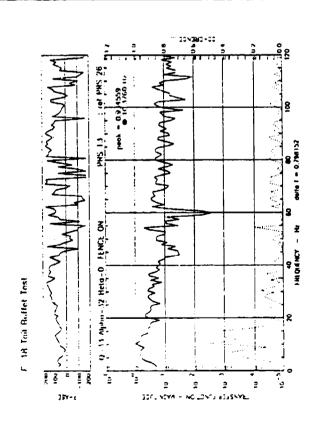


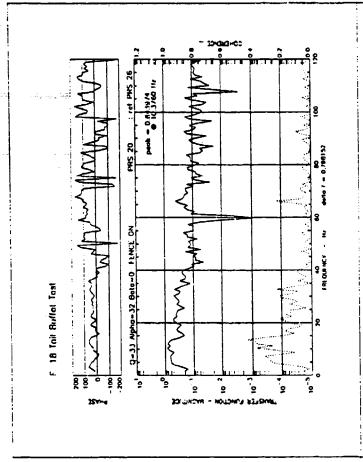


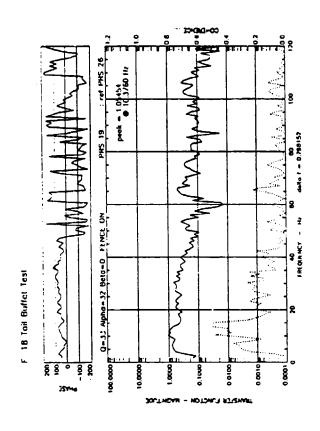


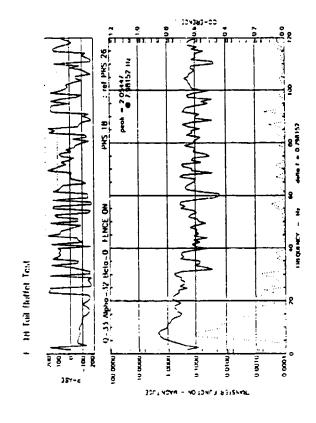


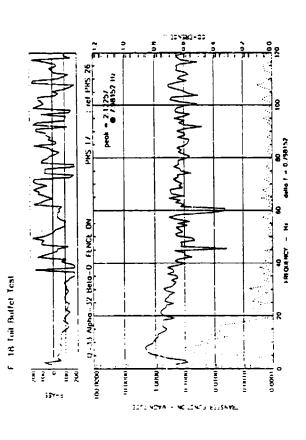


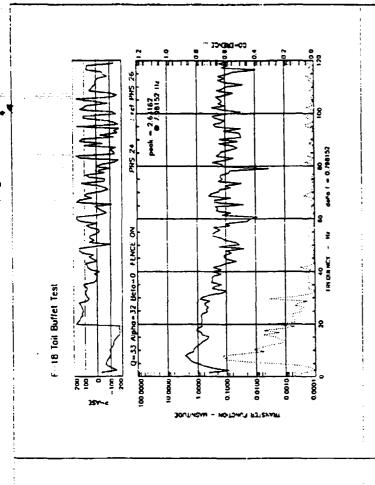


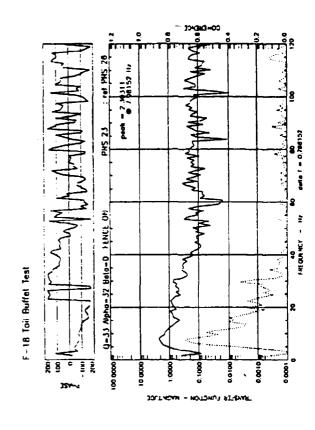


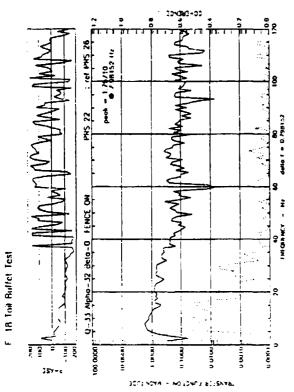


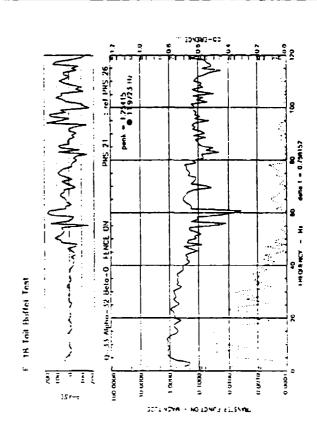


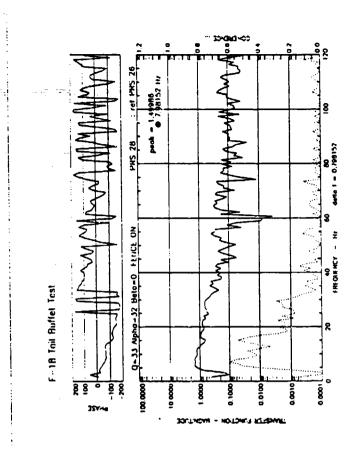


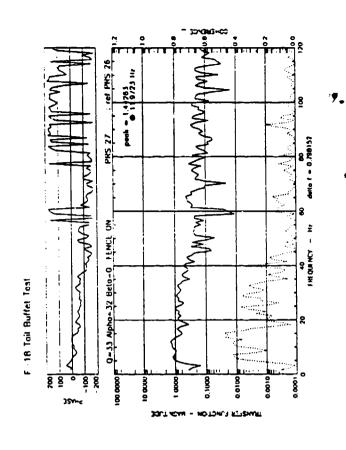


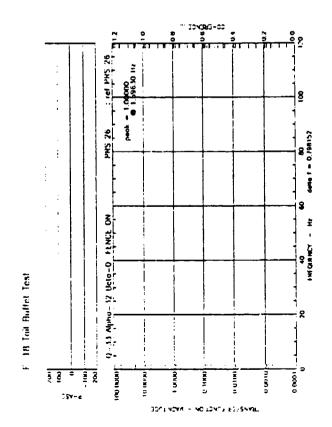


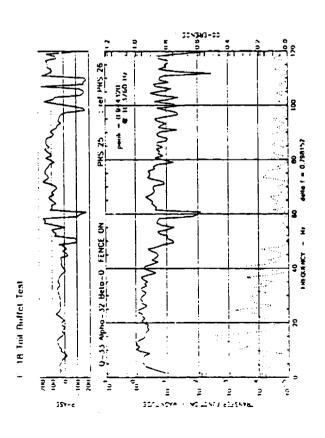


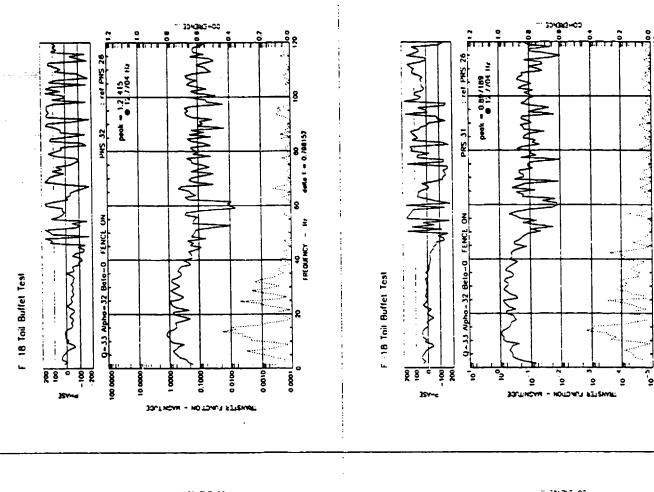


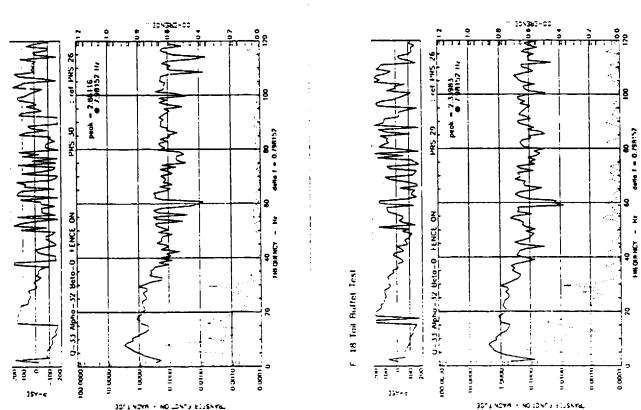




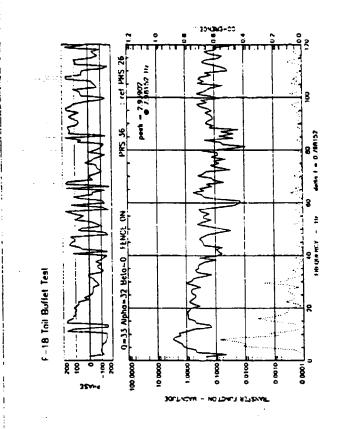


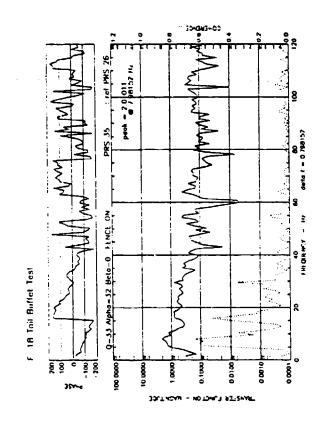


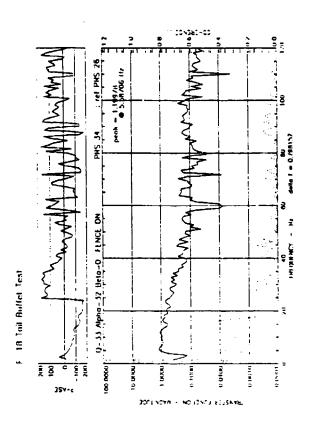


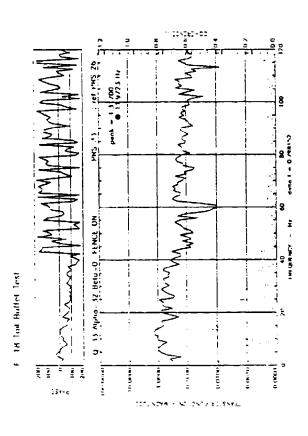


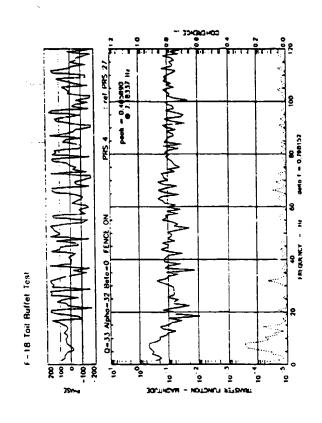
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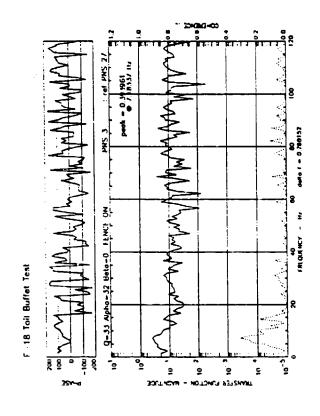


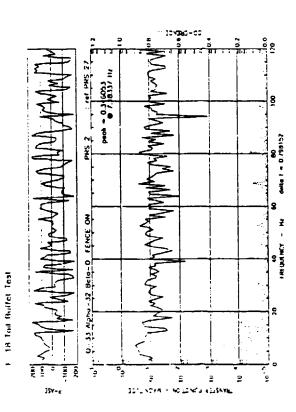


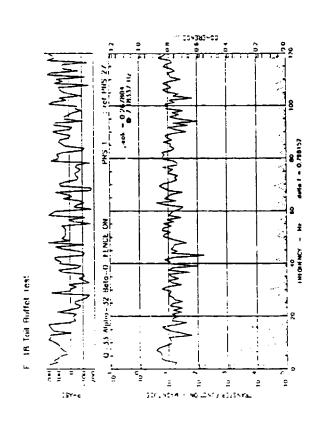


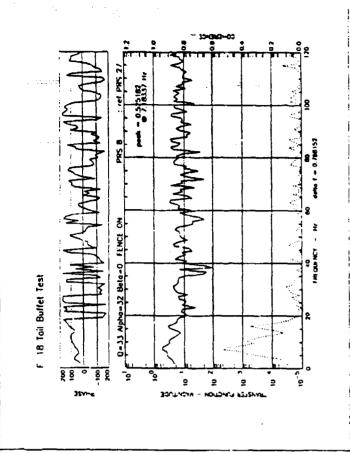


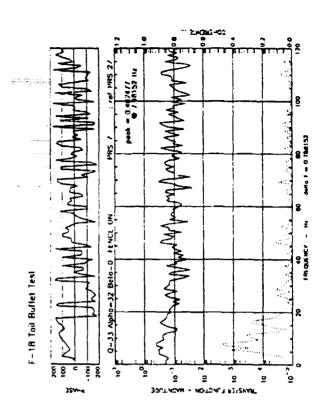


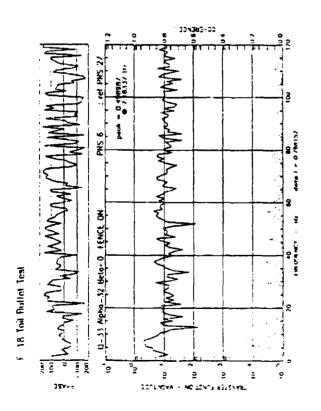


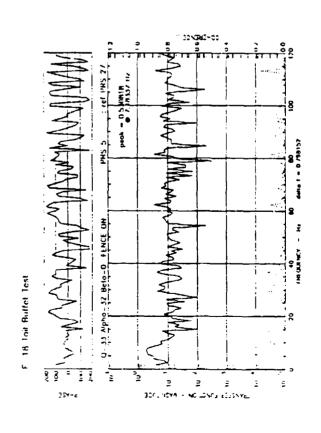


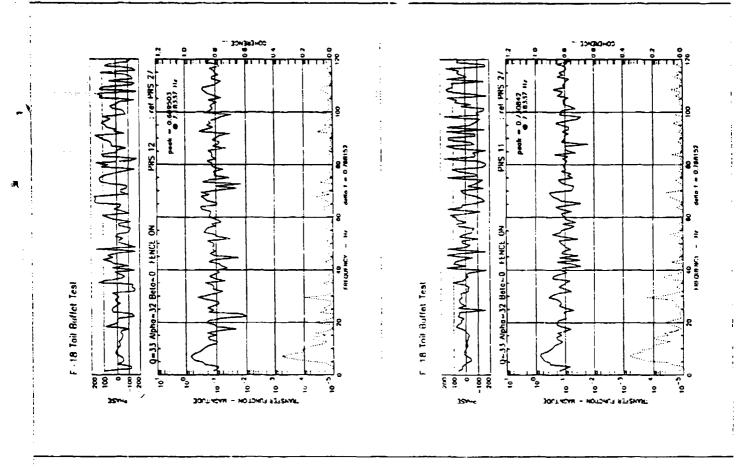


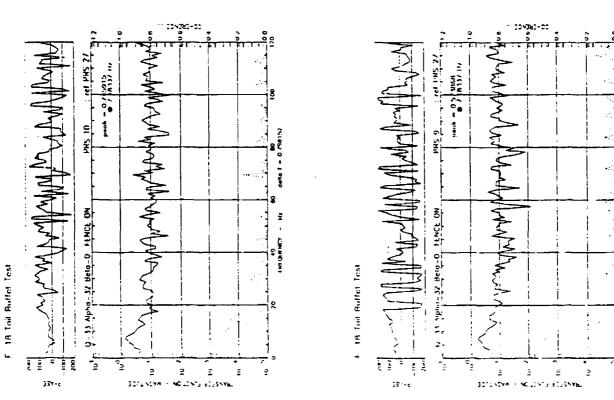


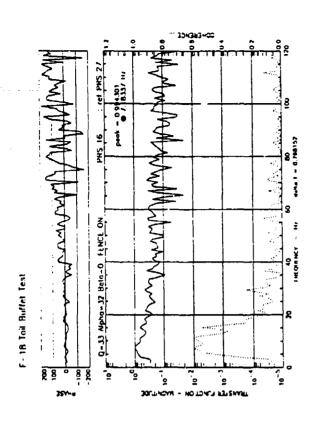


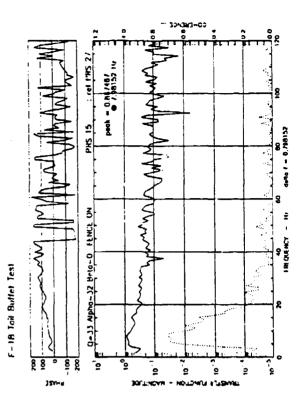


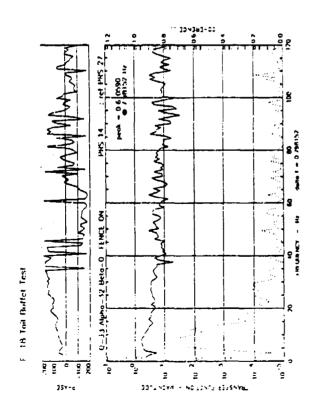


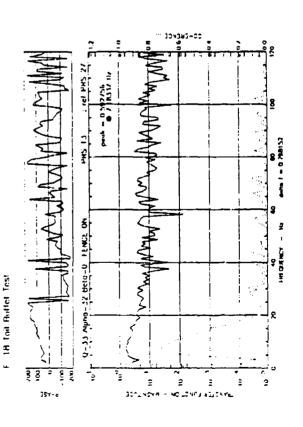


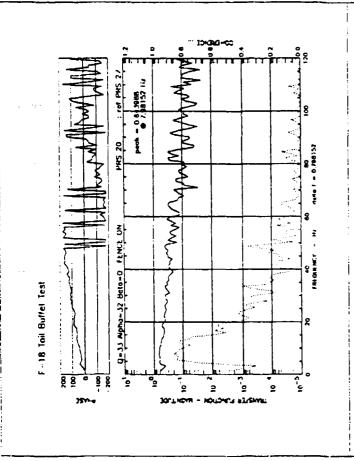


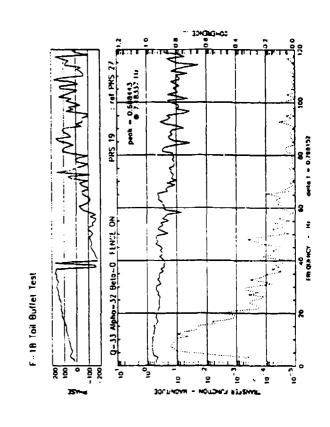


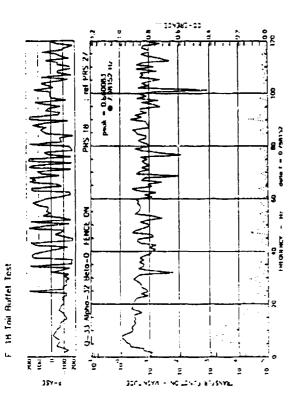


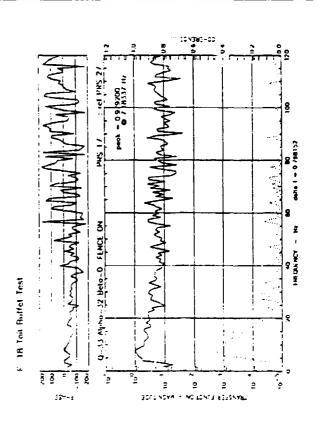


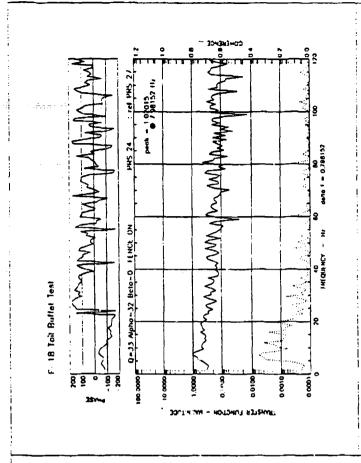


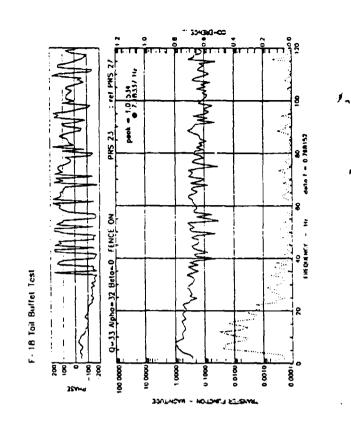


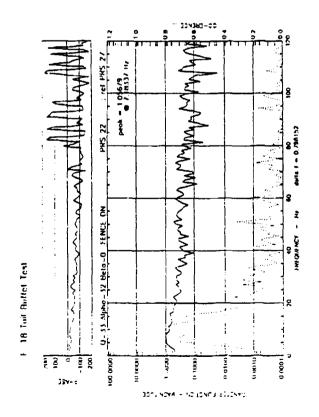


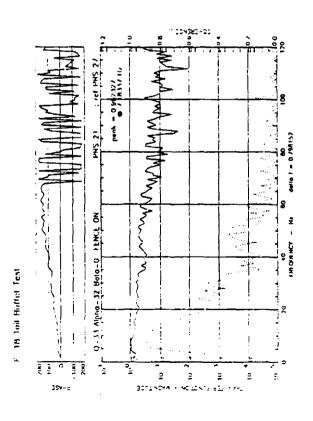


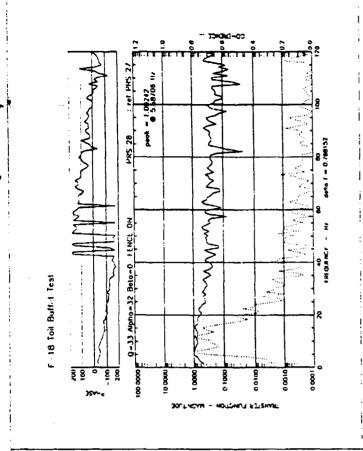


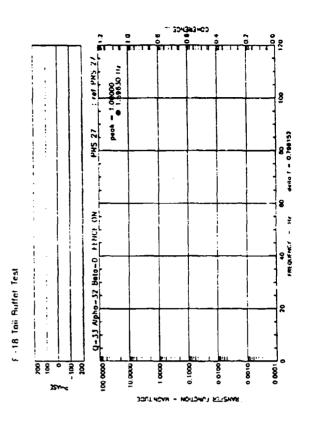


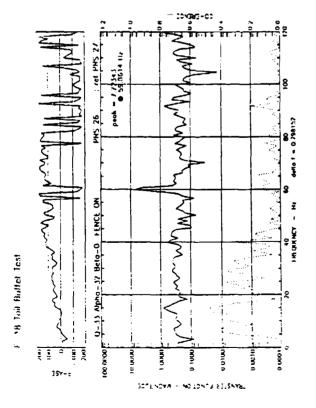


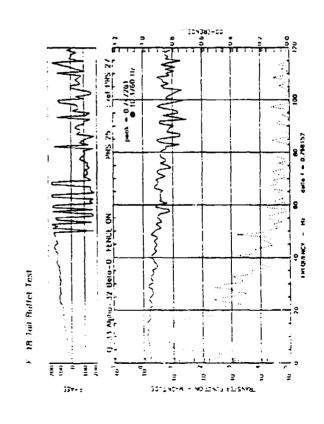


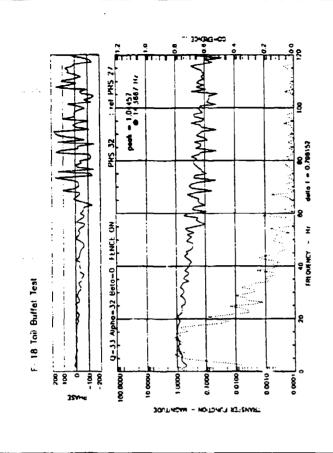


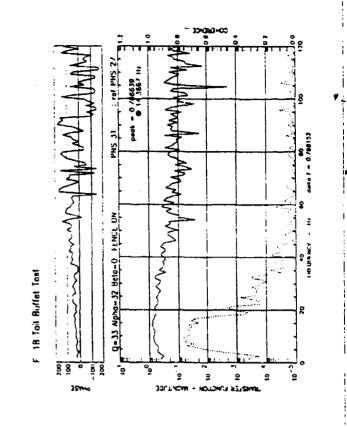


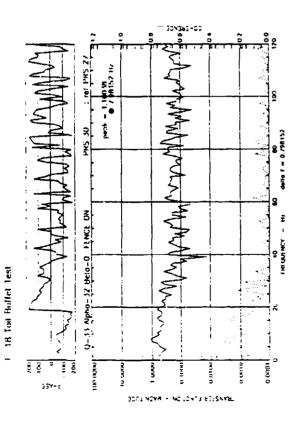


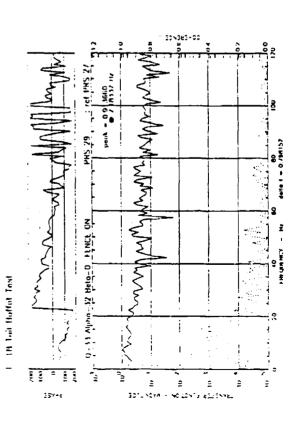


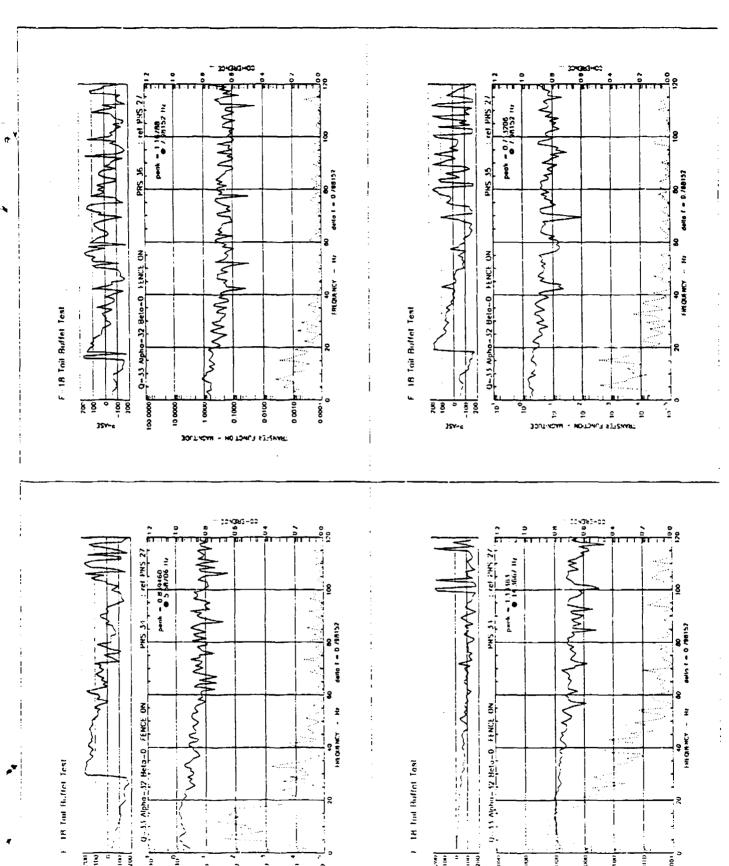












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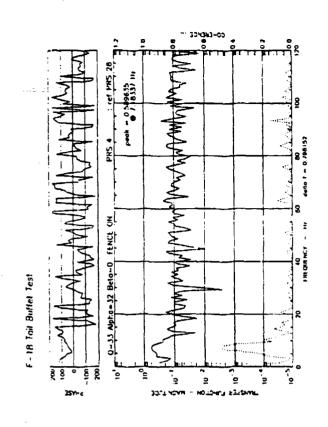
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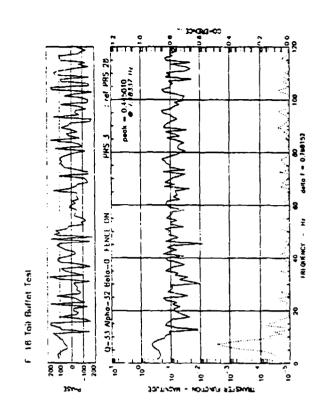
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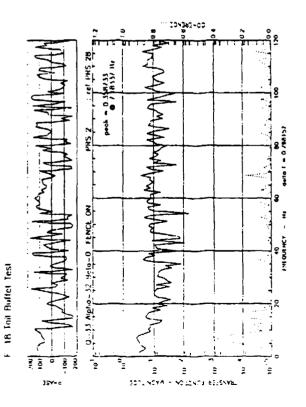
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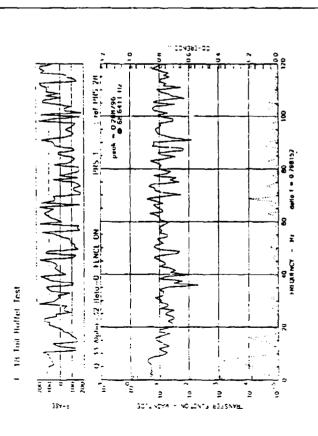
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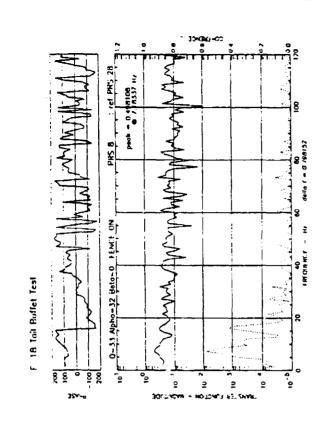
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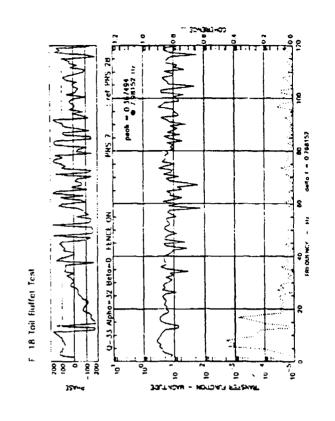


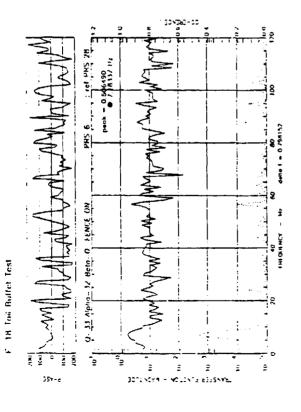


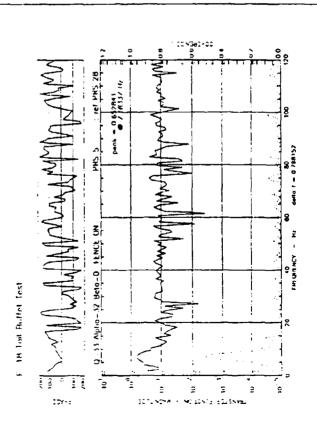


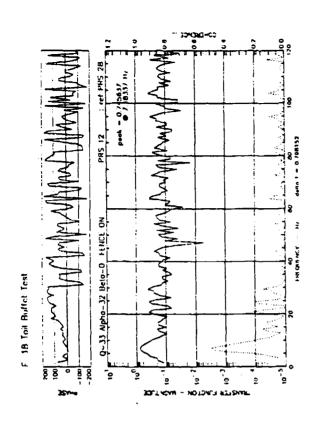


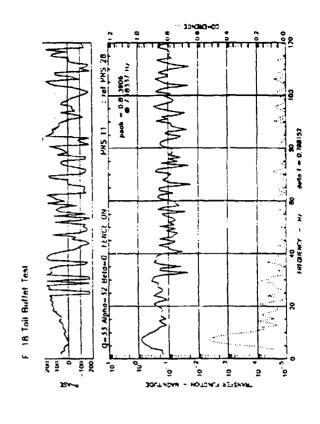


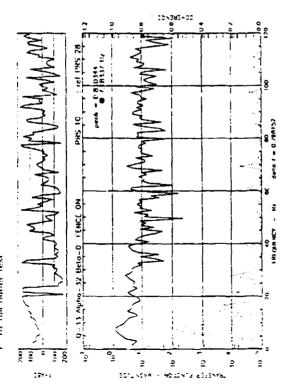


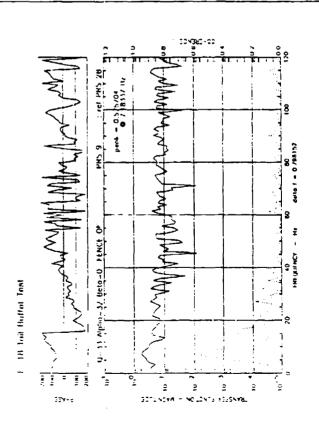


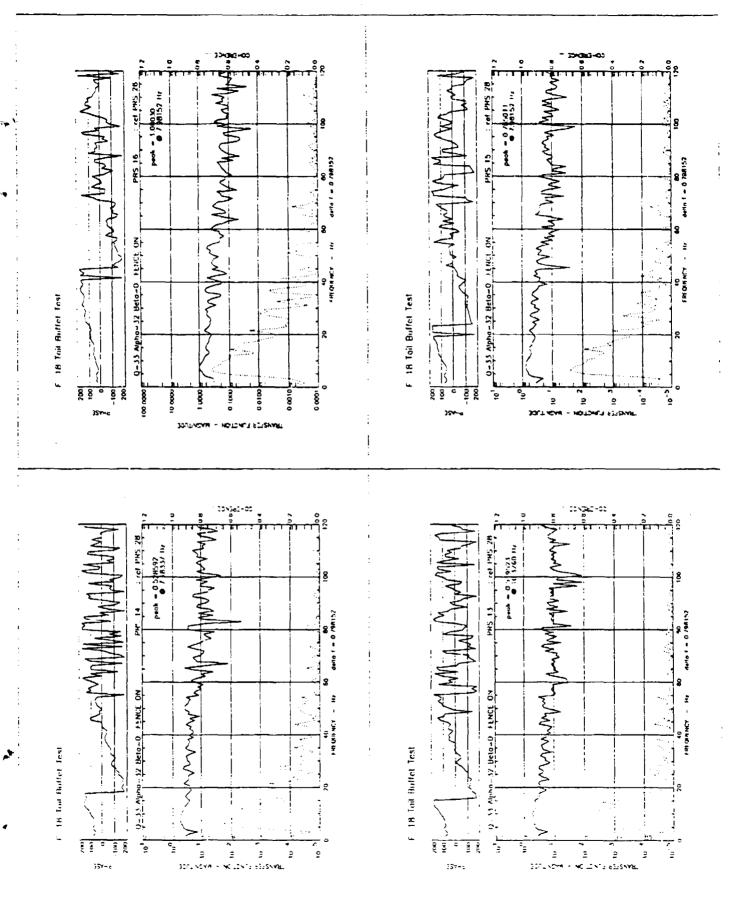


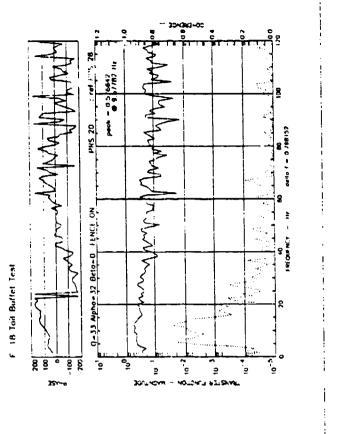


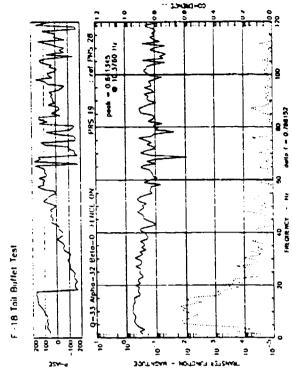


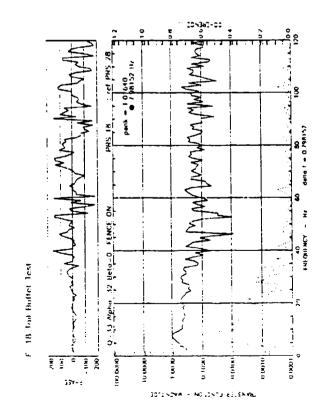


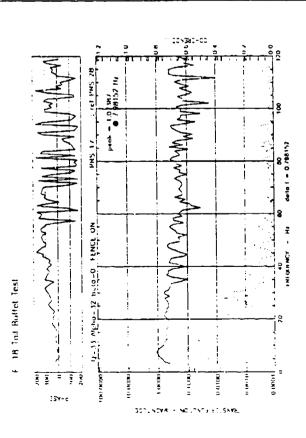


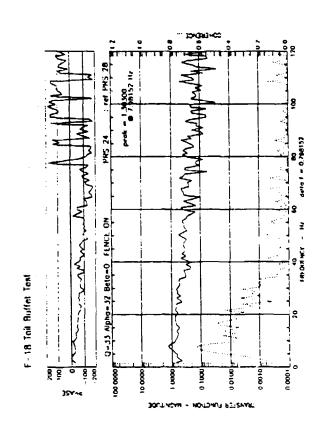


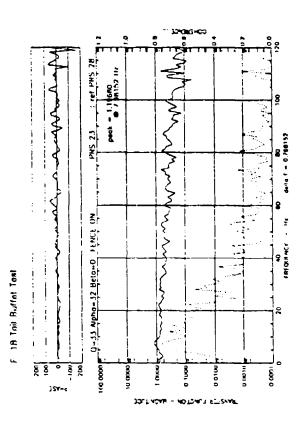


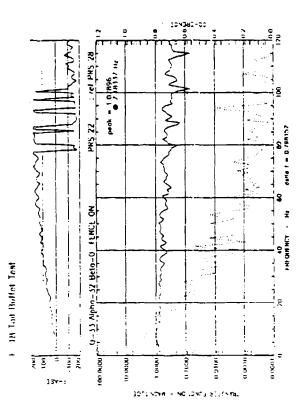


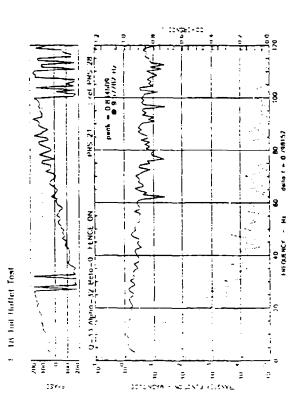


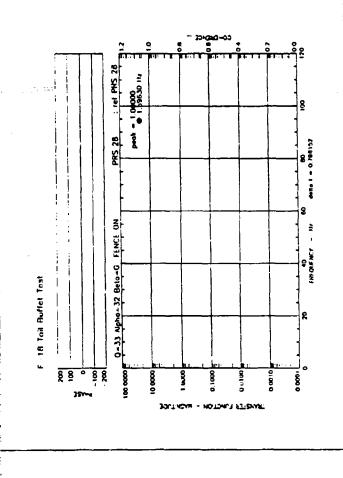


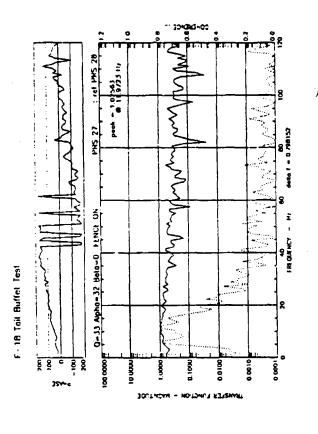


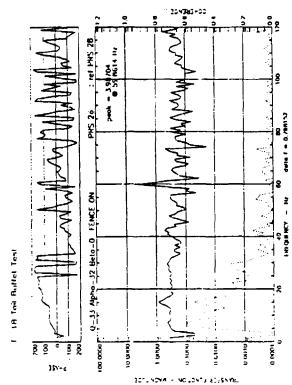


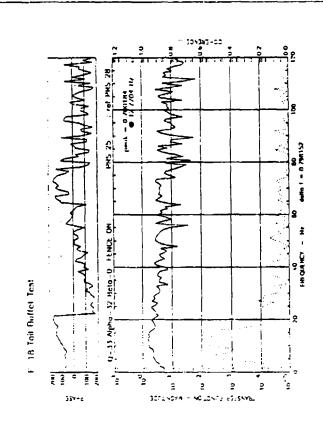


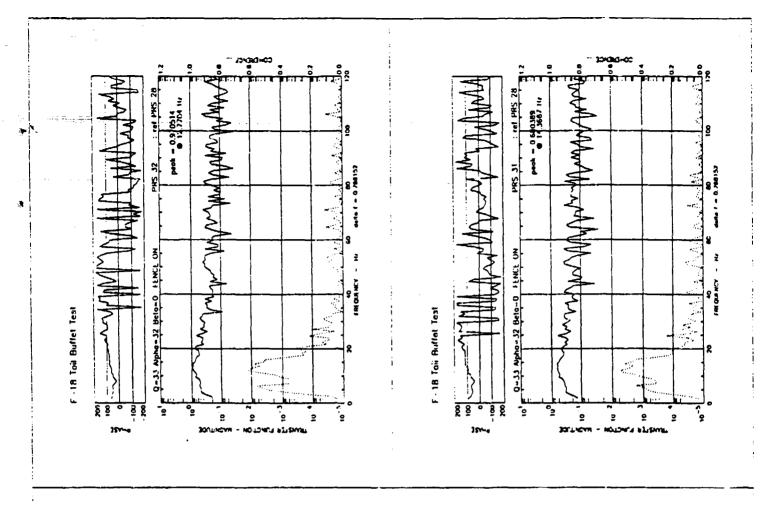


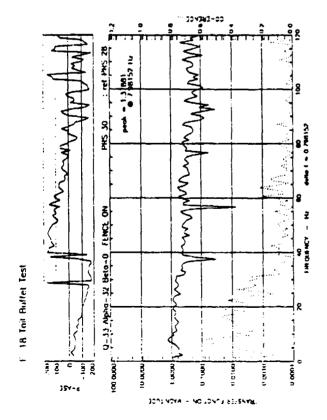


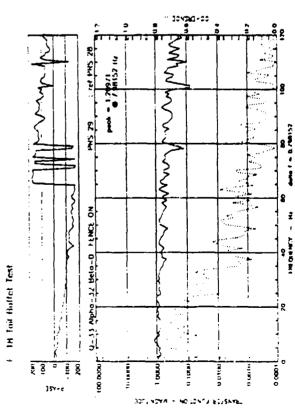


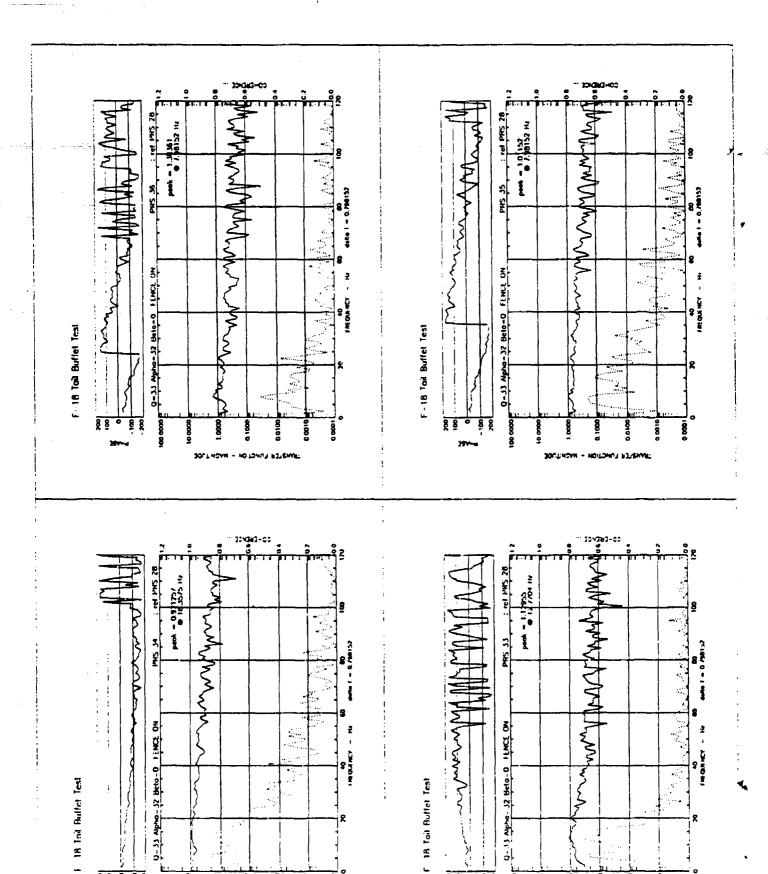












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SOUTHEAN - MO TOHUR STREAM

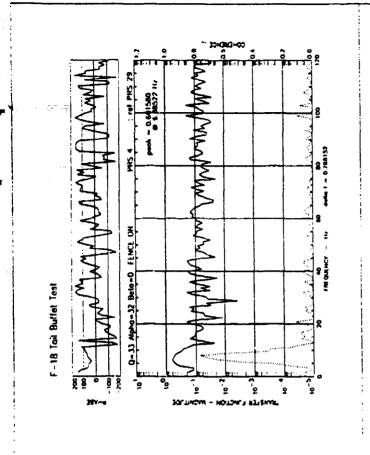
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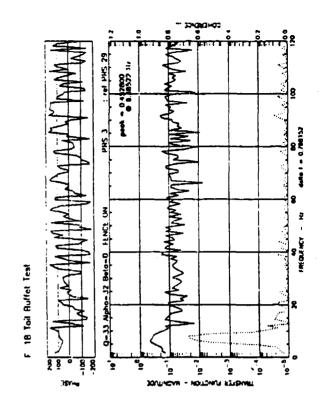
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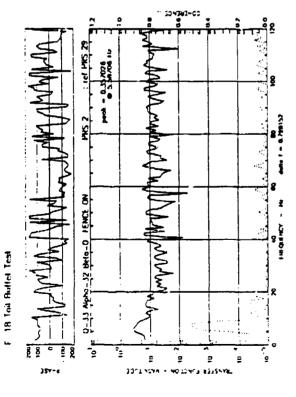
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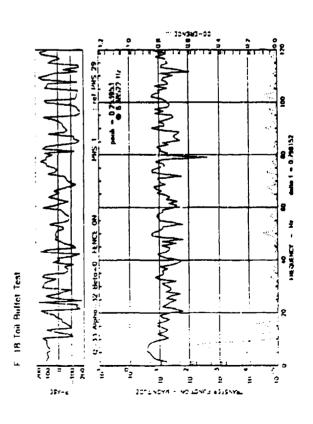
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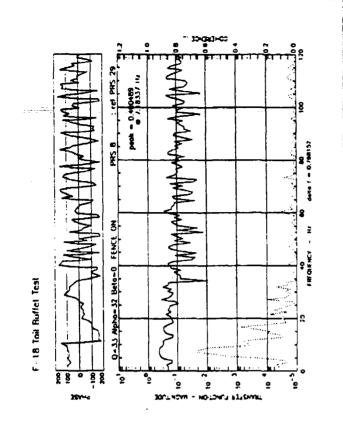
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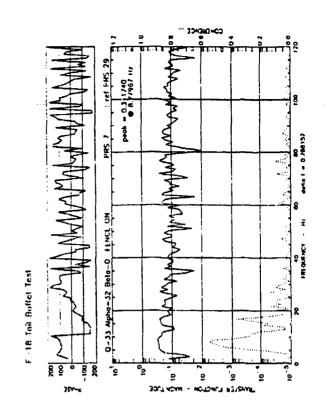


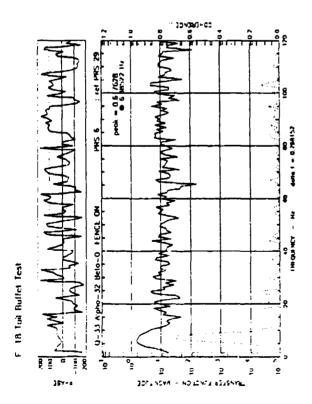


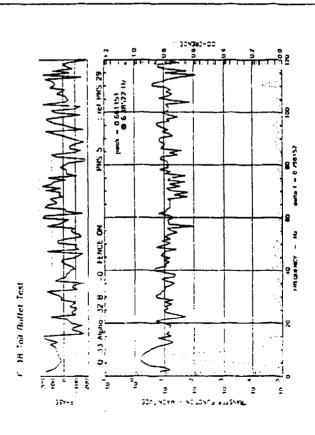


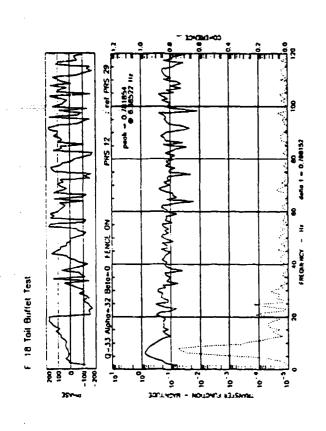


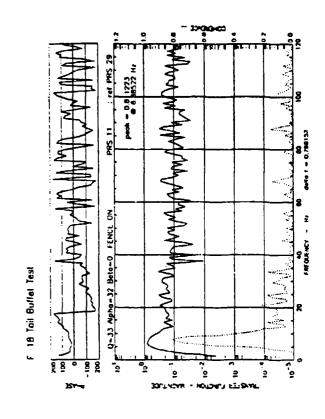


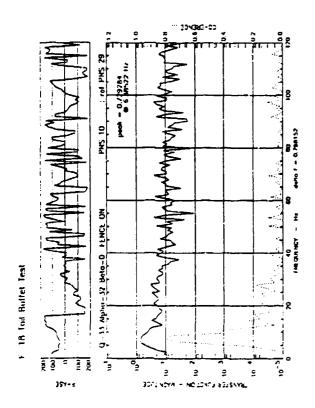


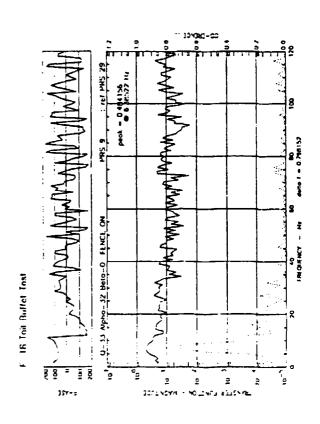


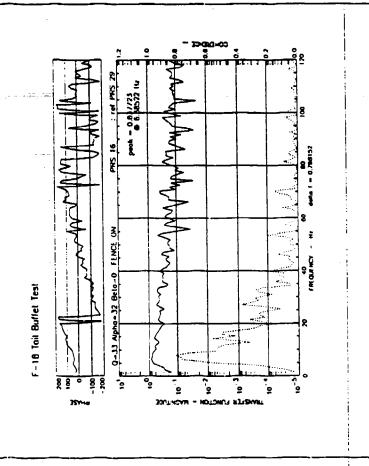


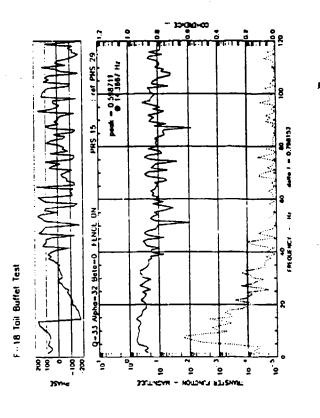


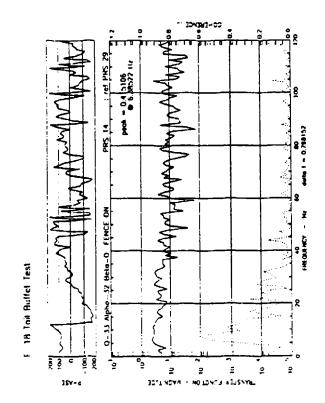


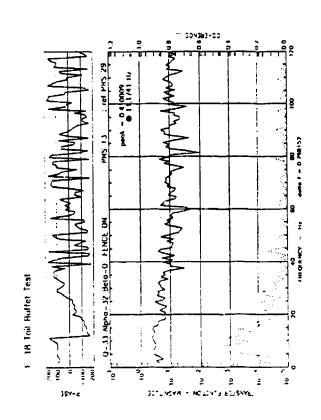


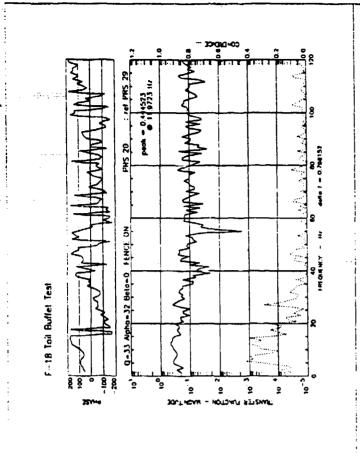


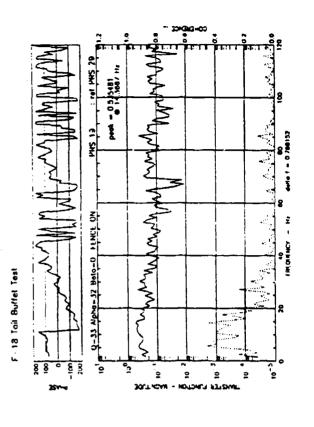


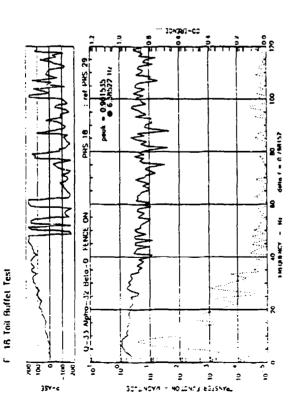


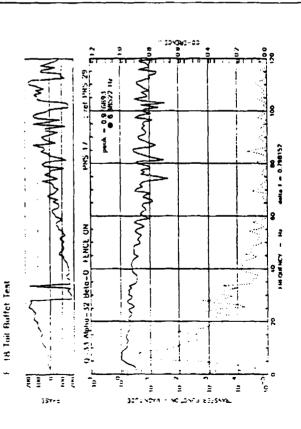


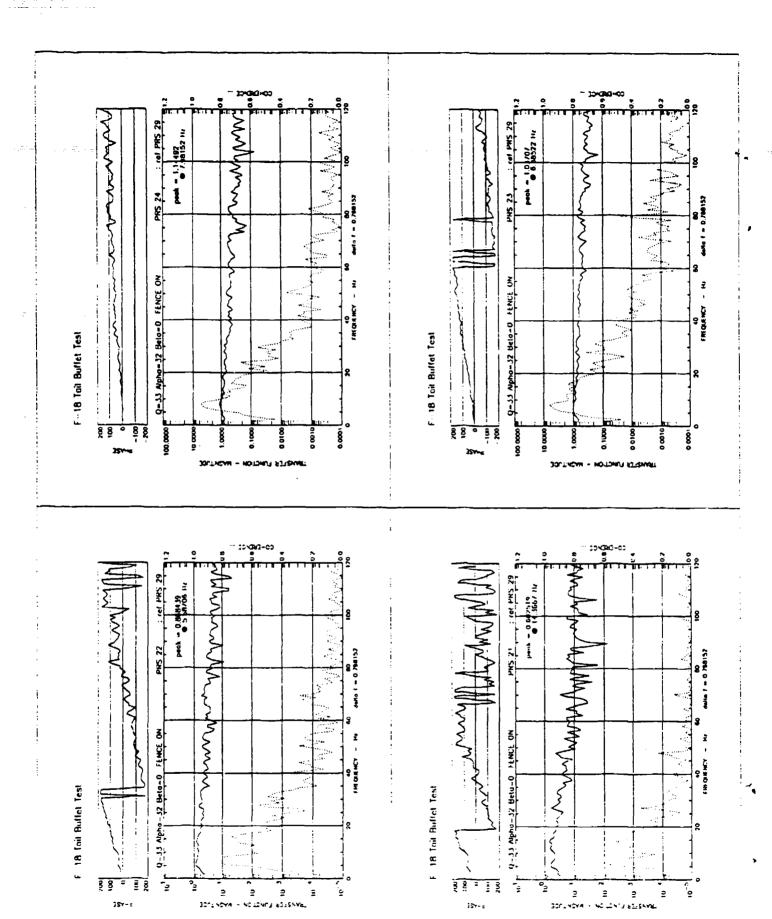


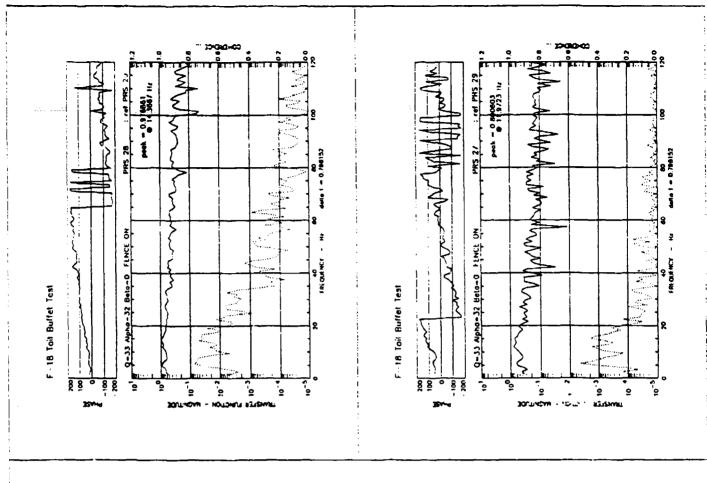


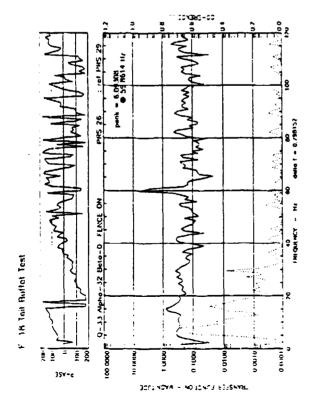


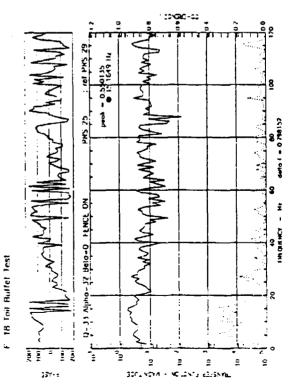


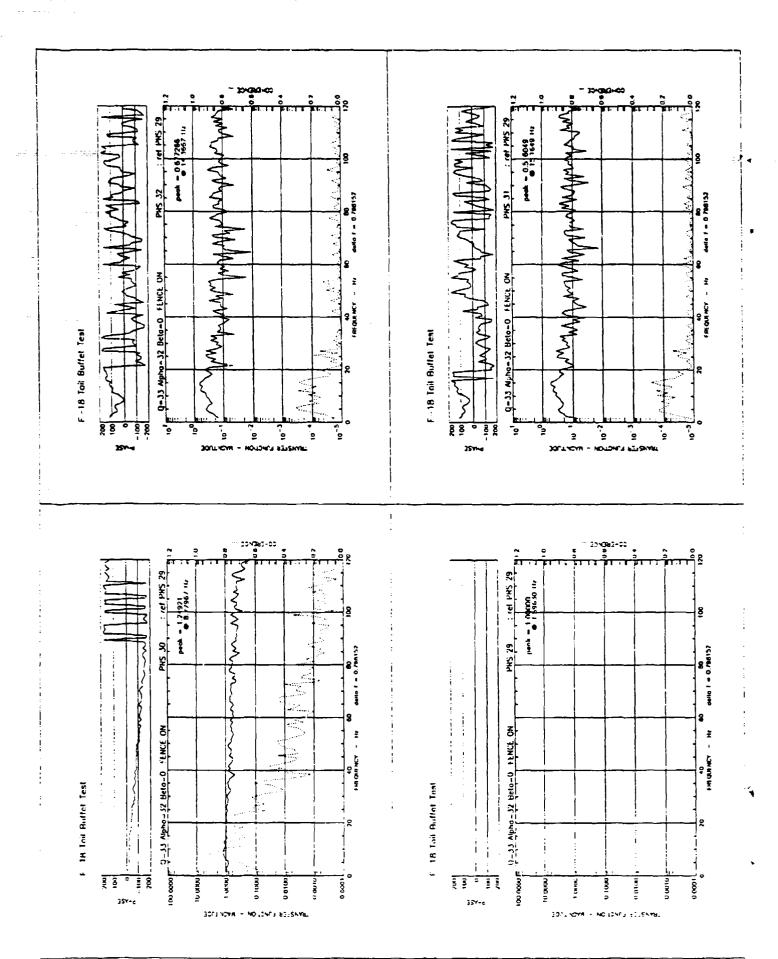


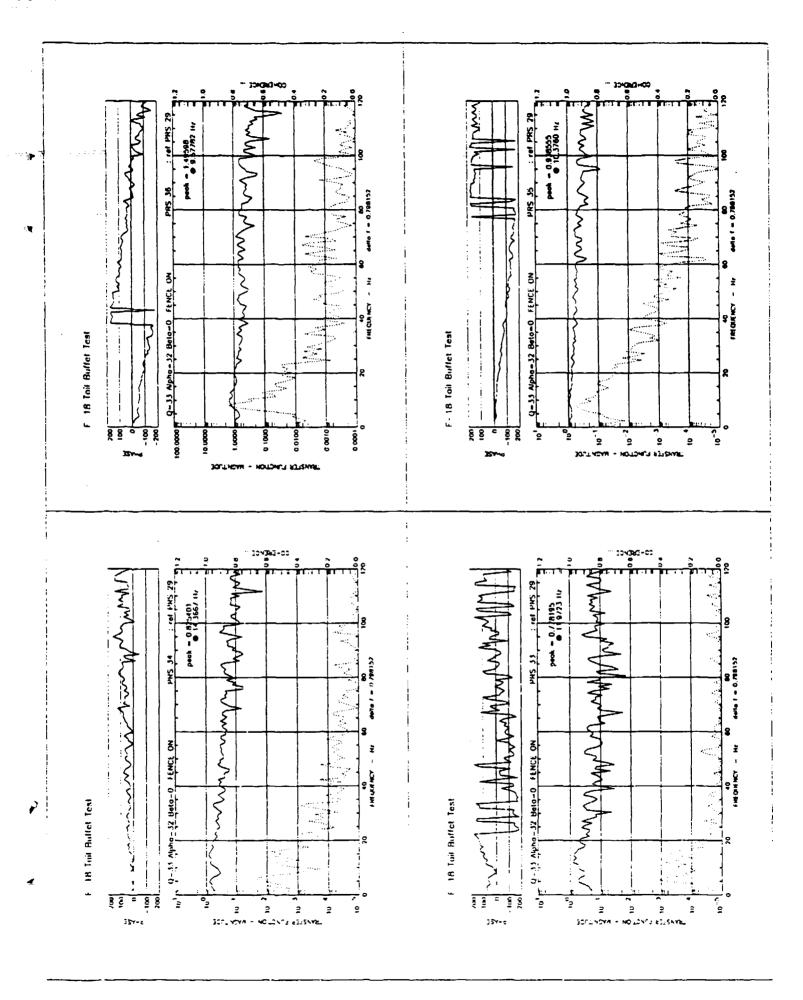


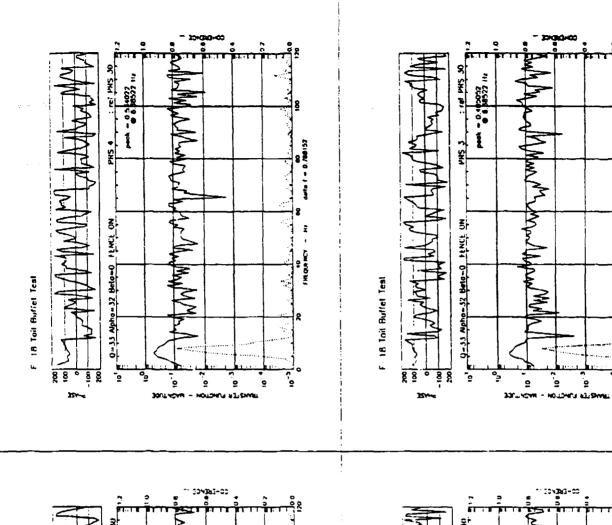


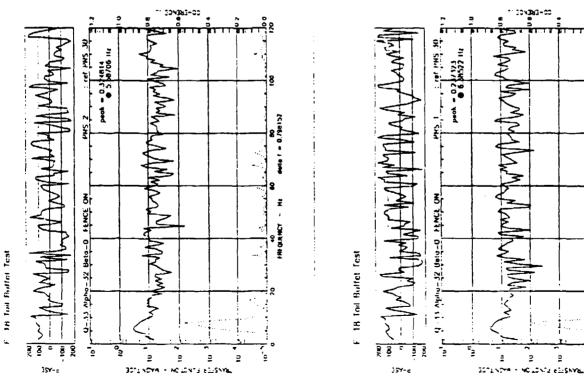




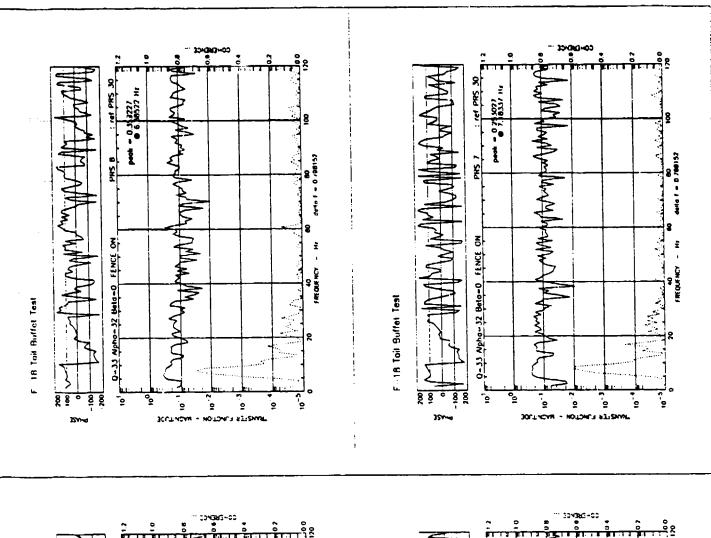


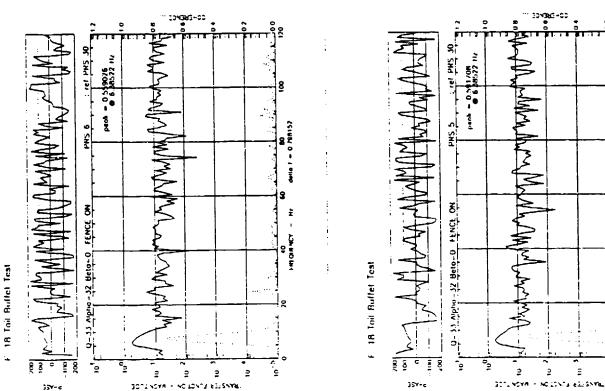


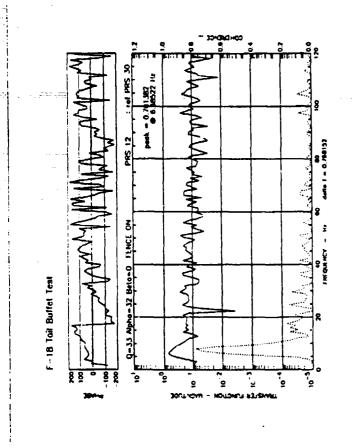


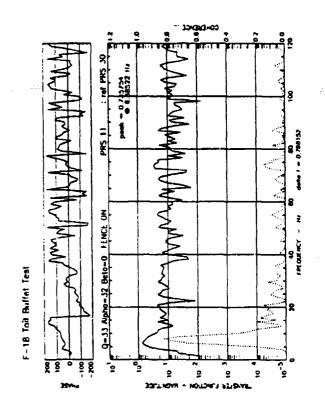


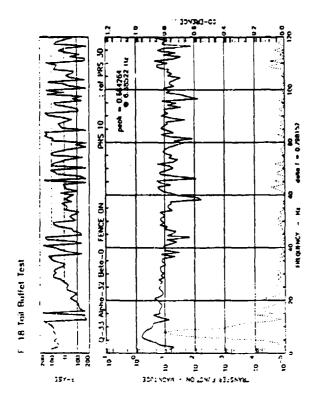
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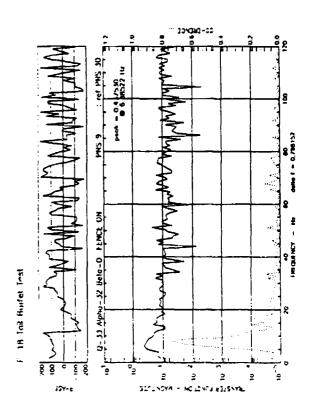


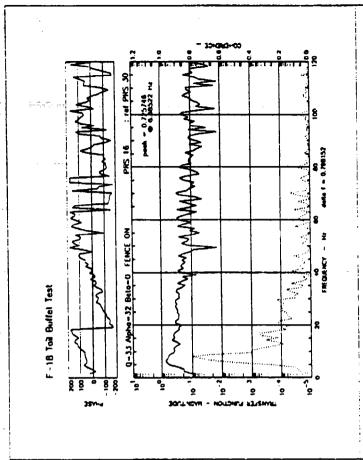




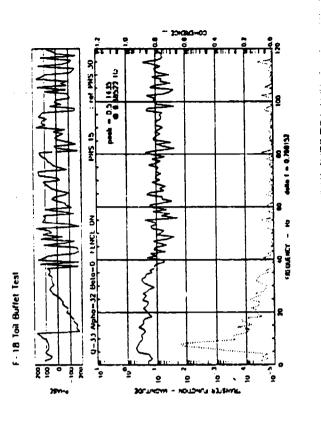


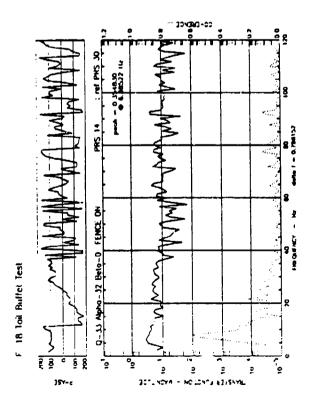


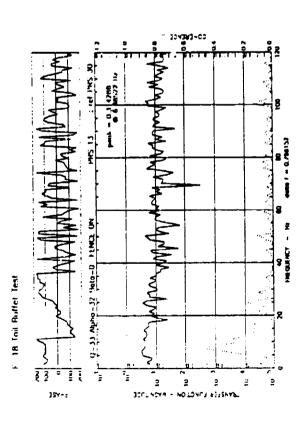


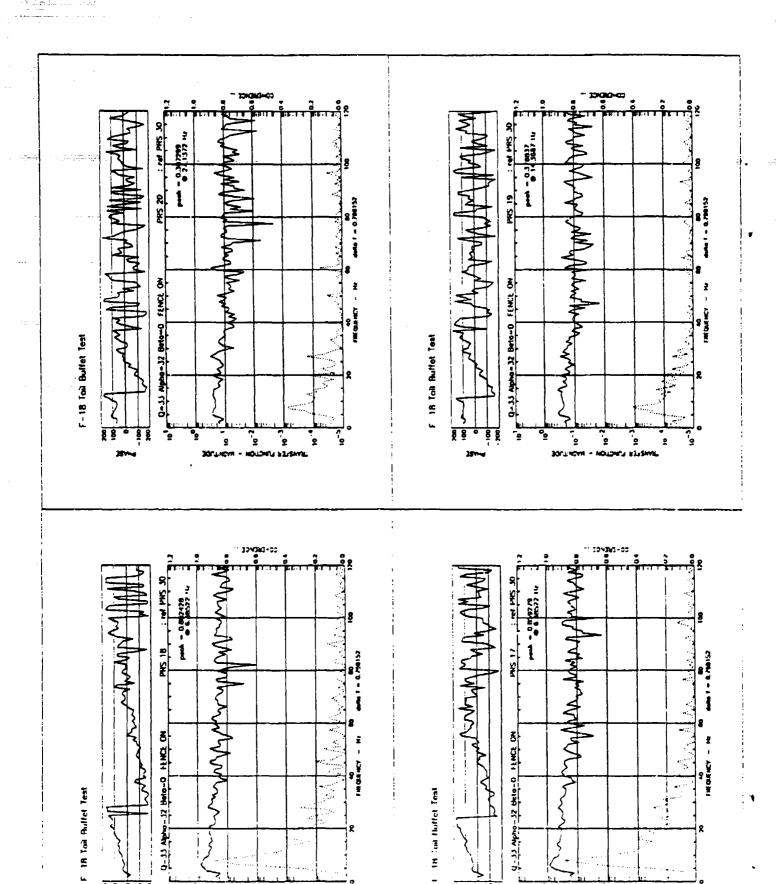


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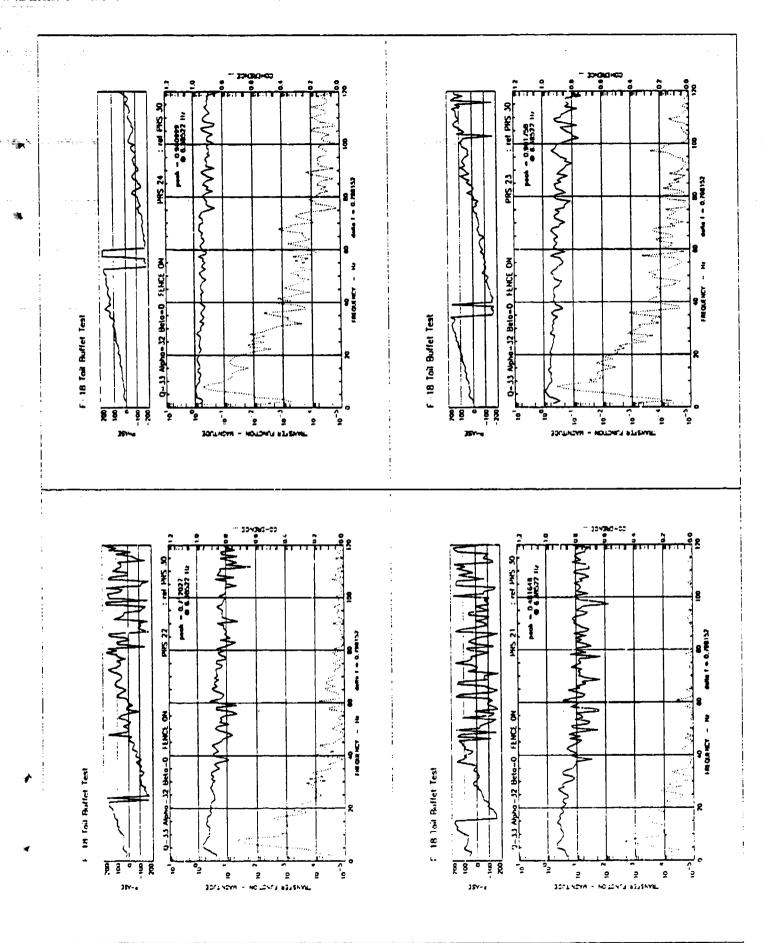


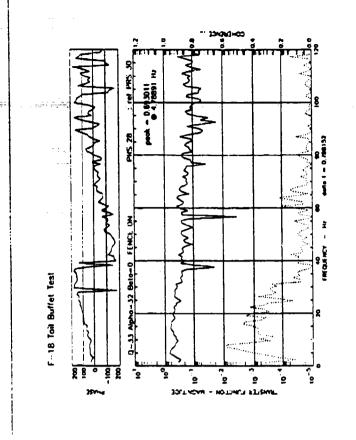
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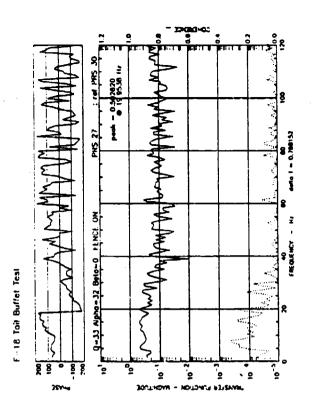
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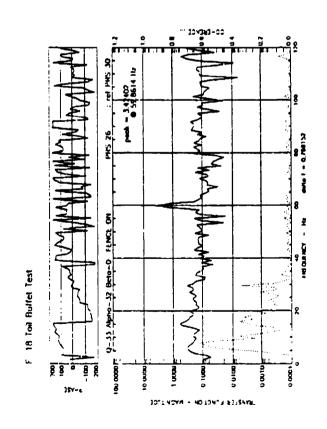
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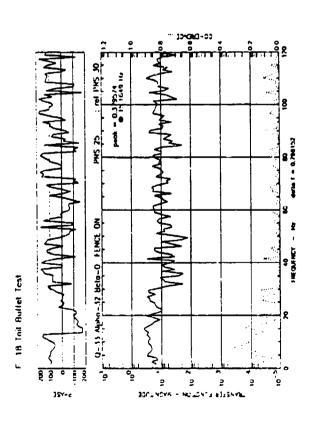
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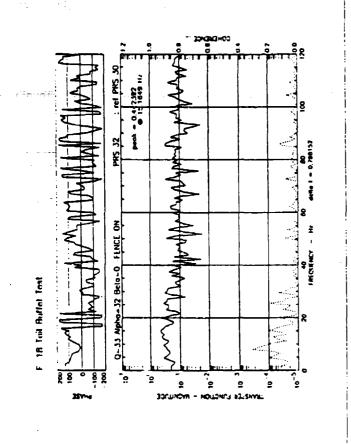


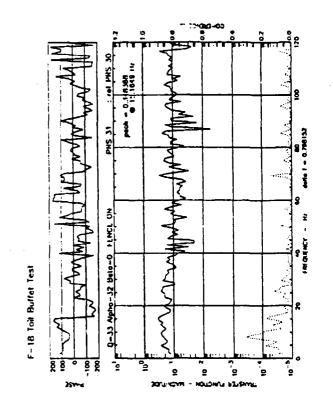


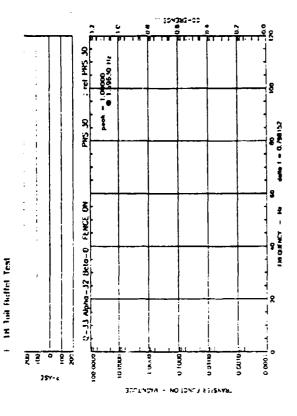


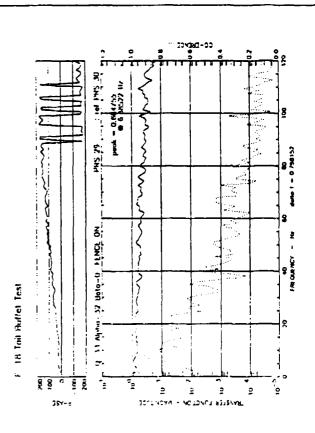


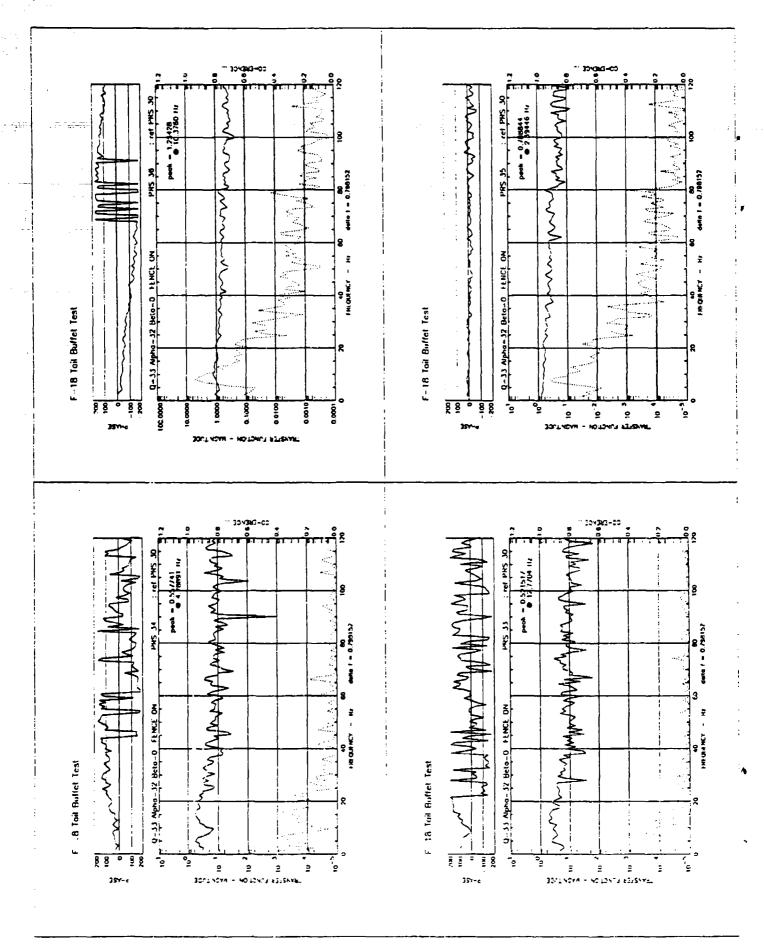


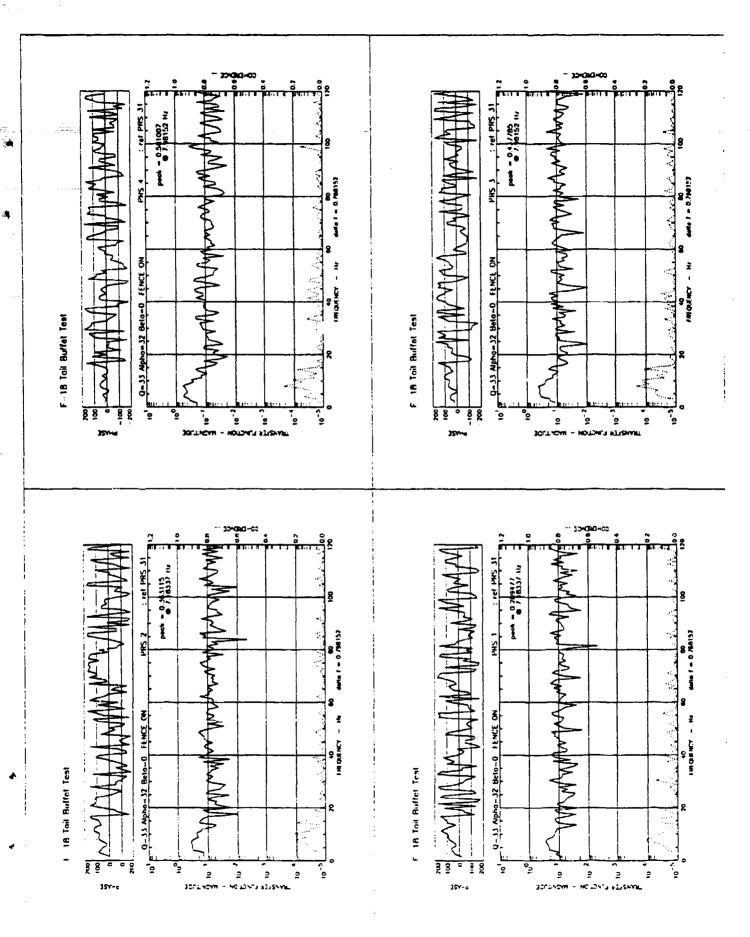


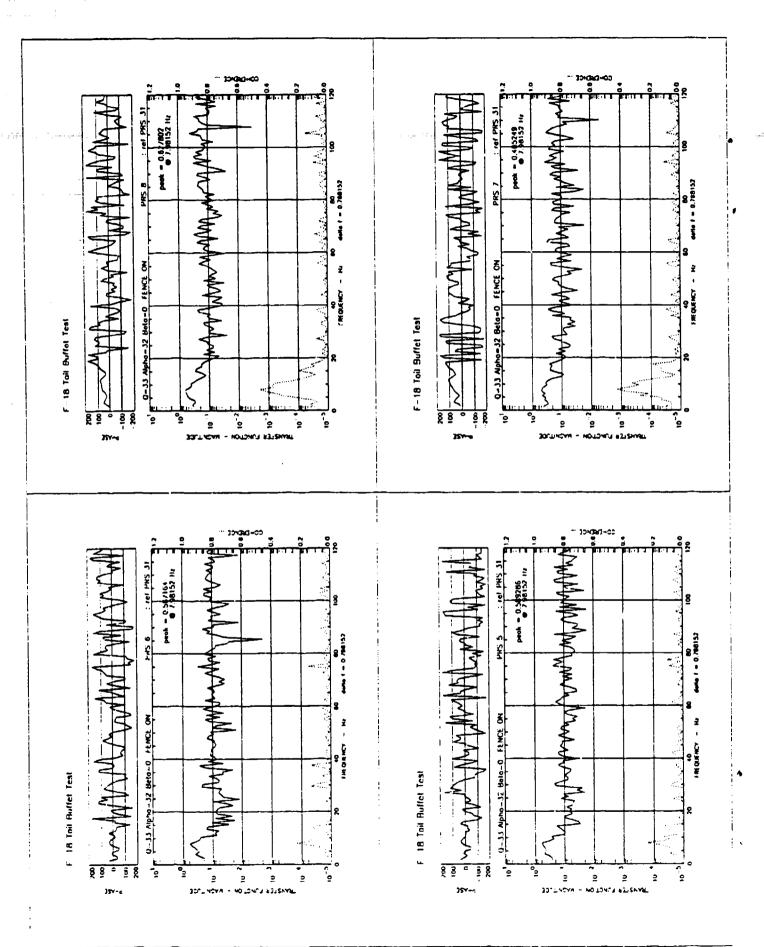


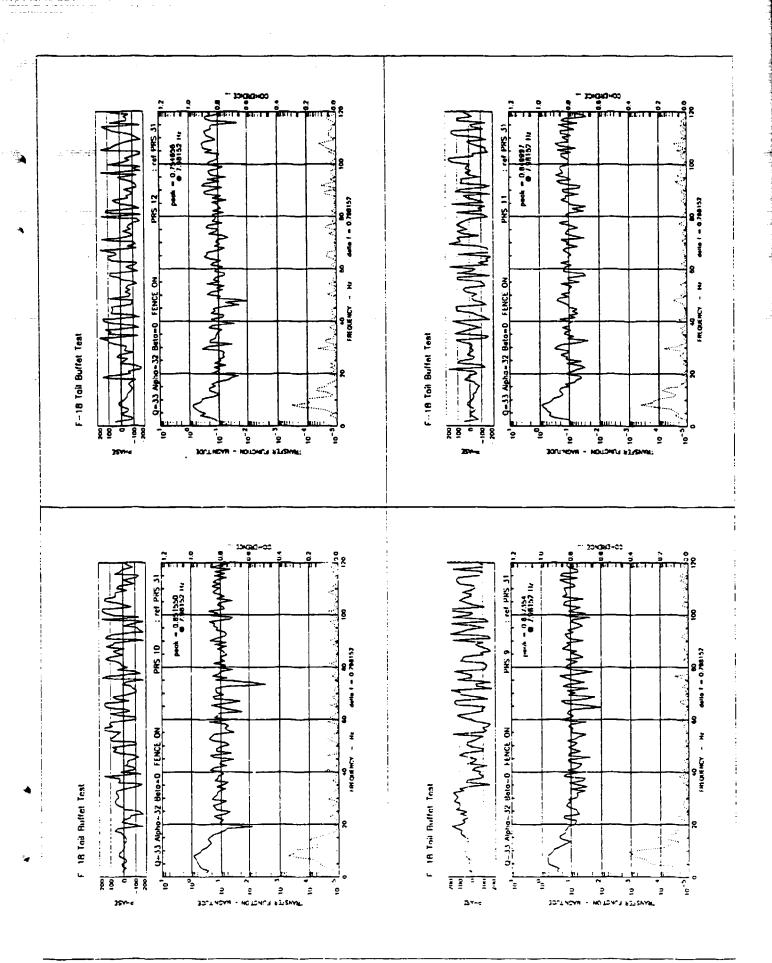


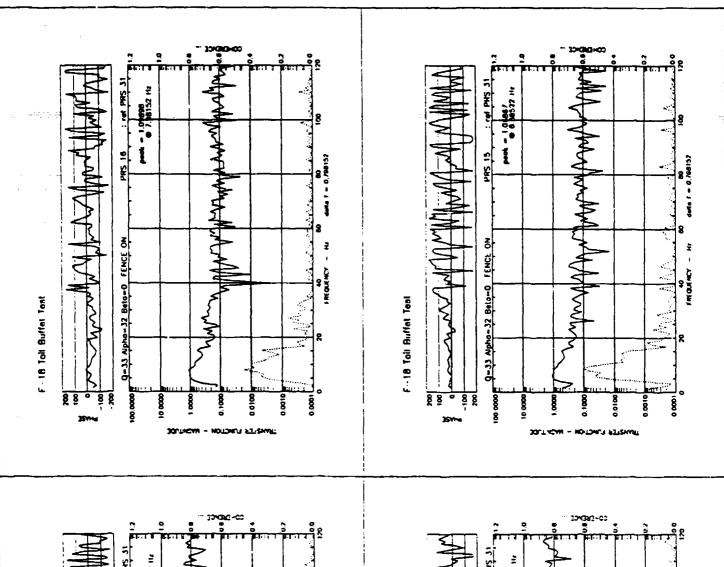


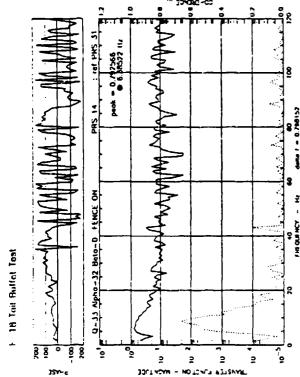


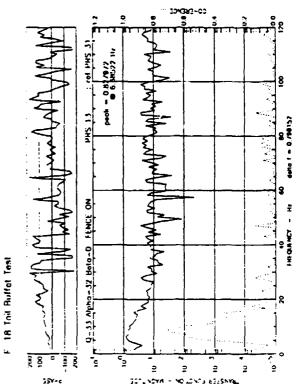


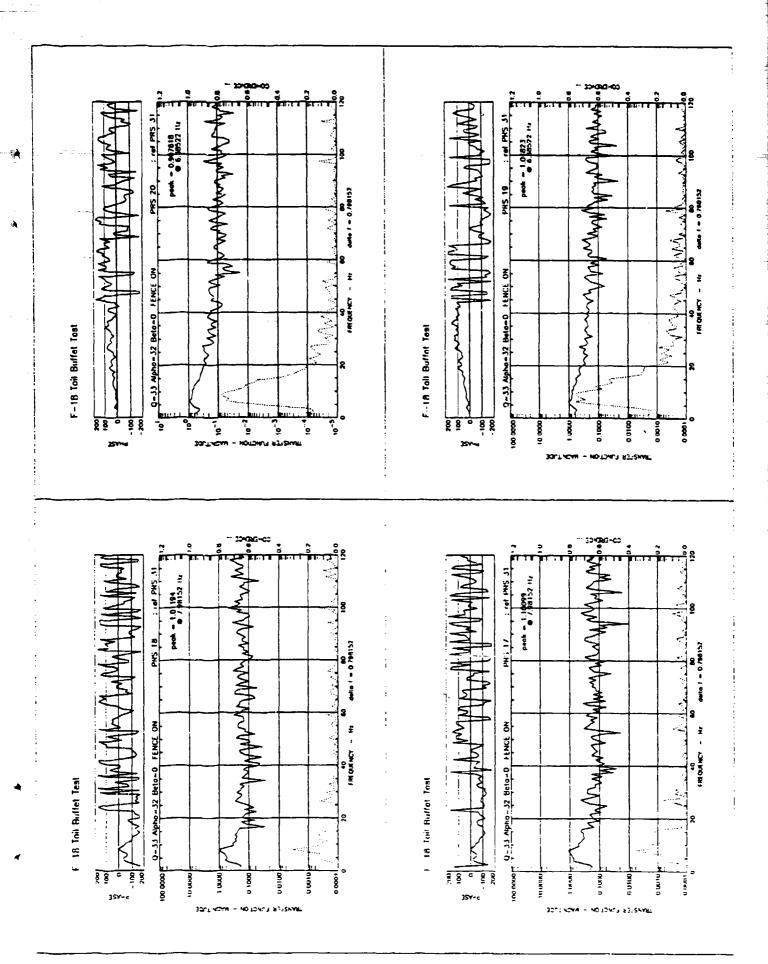


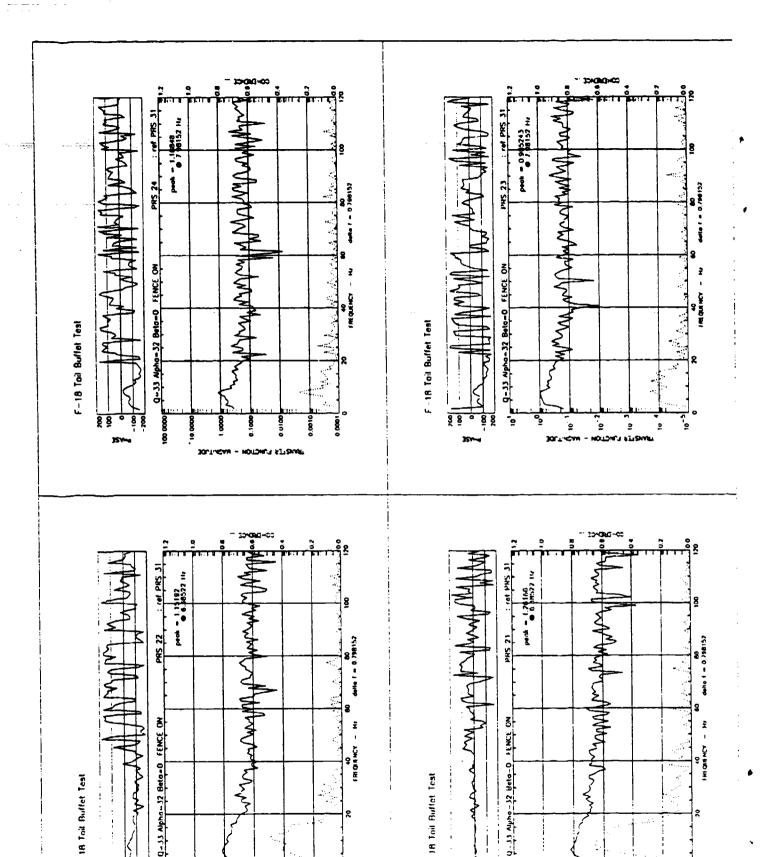












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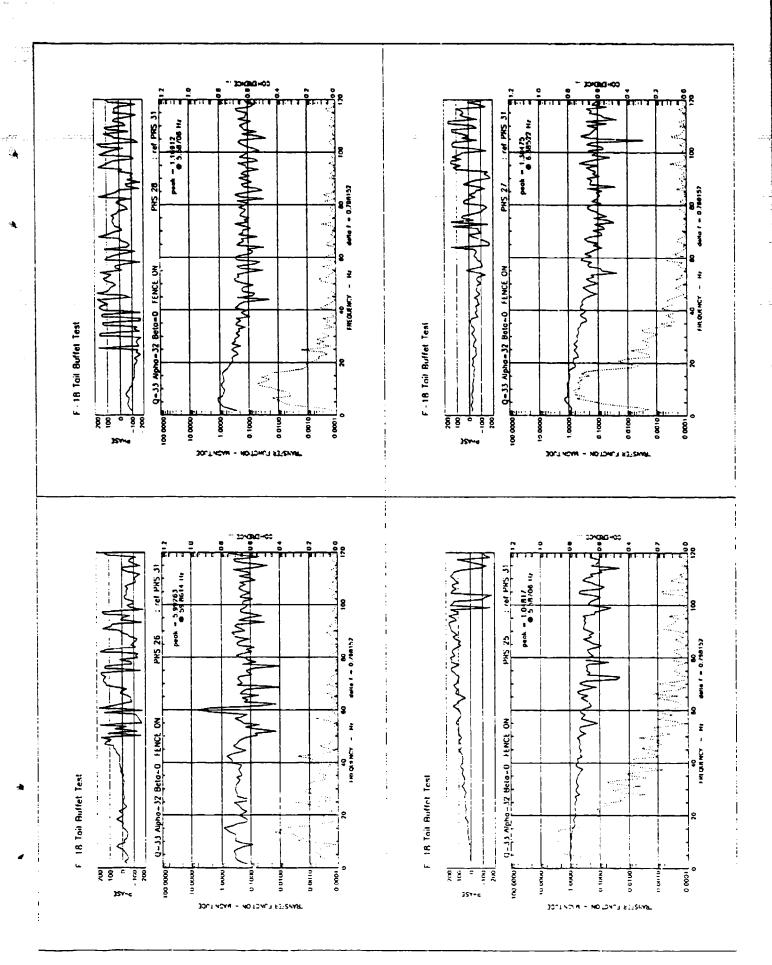
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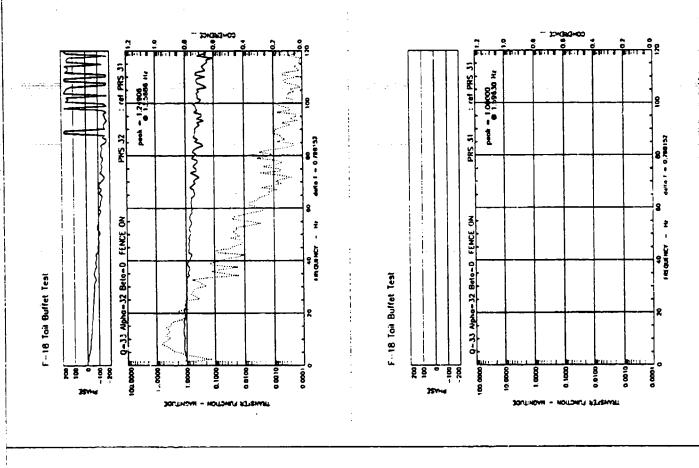
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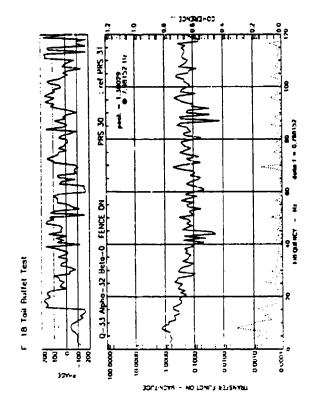
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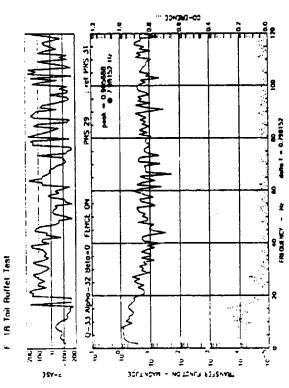
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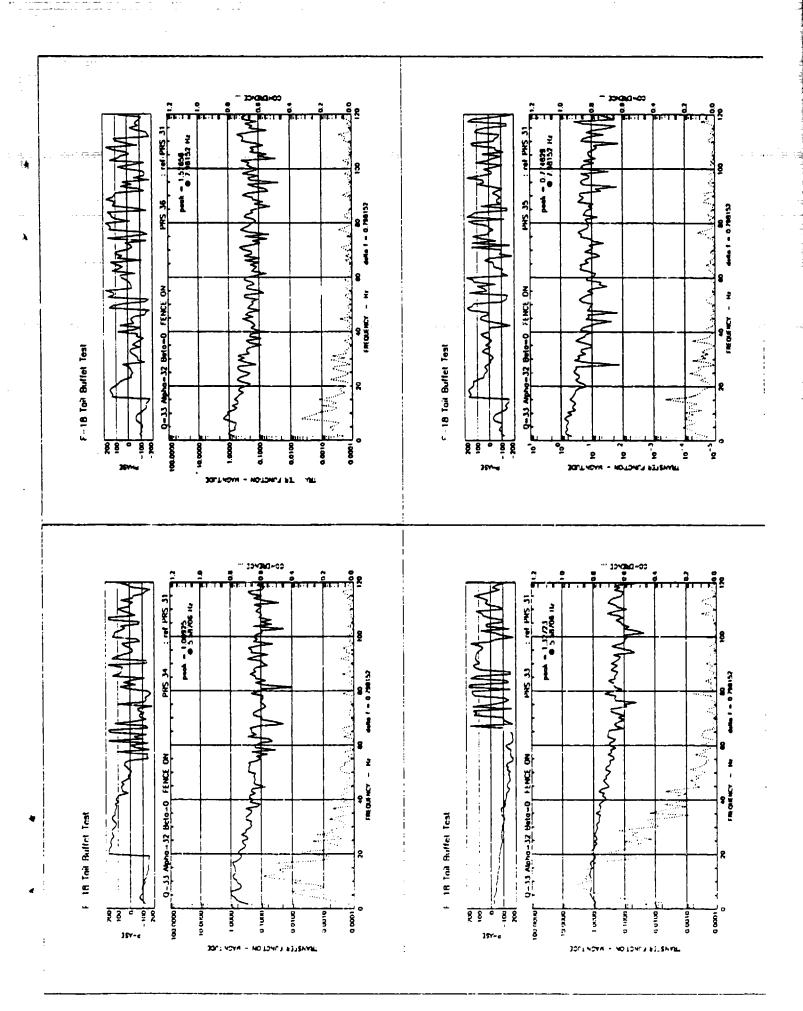
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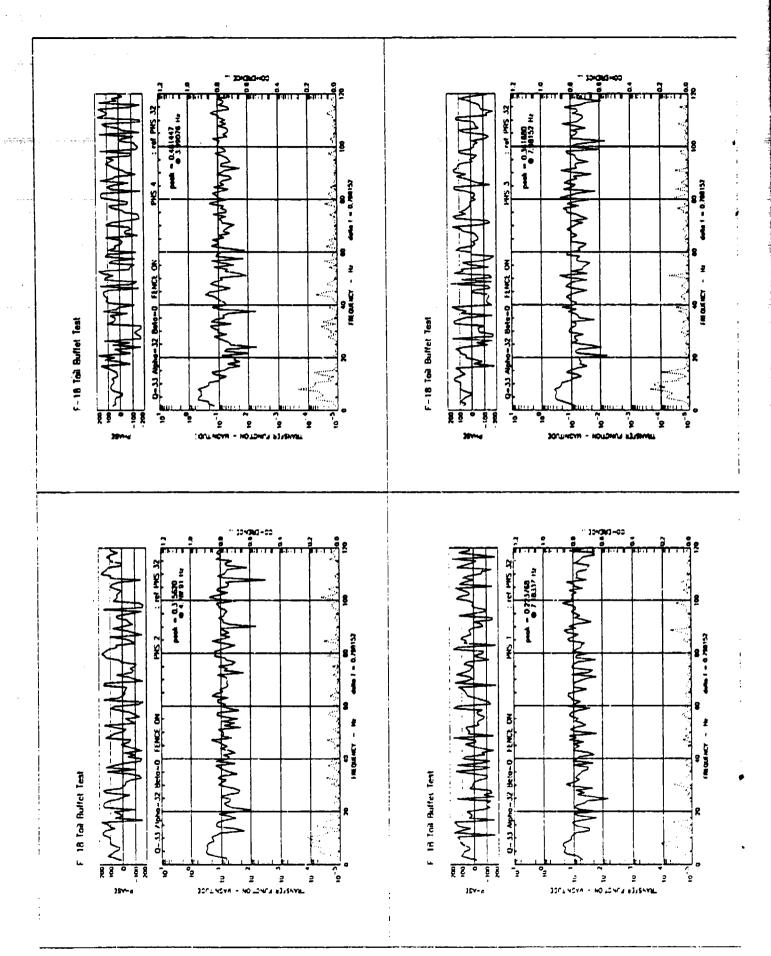


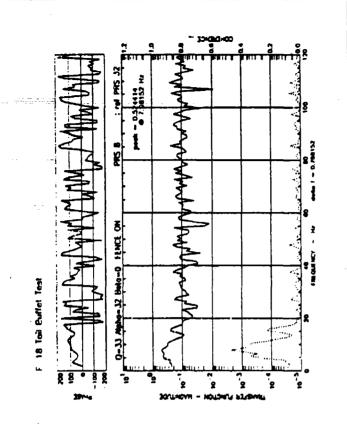


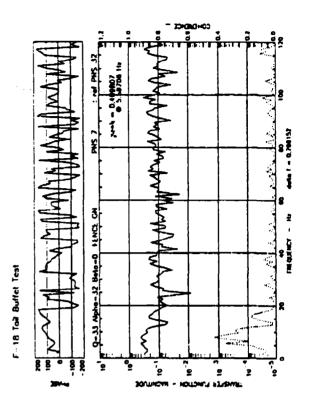


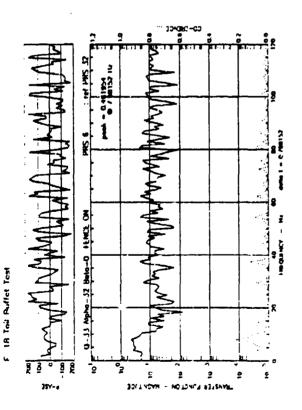


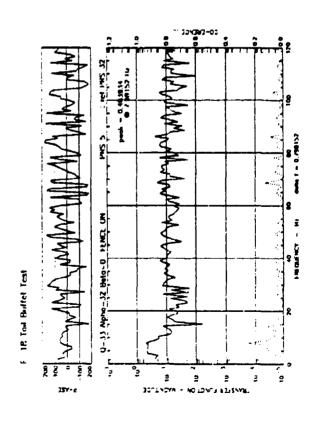


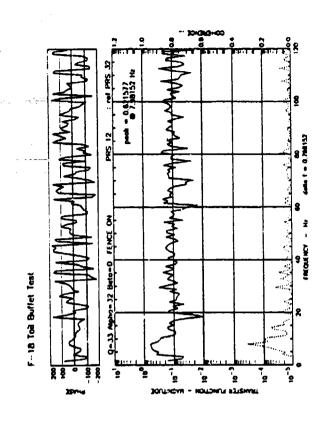


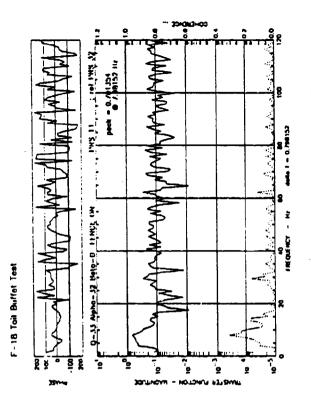


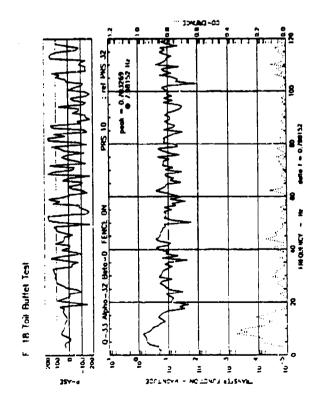


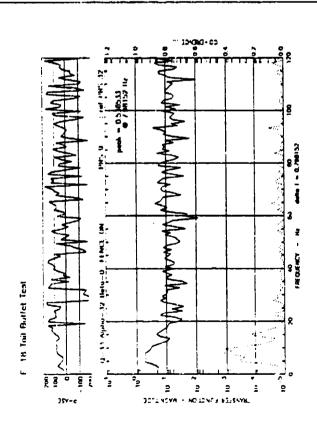


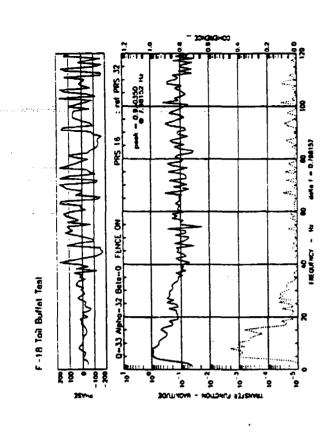


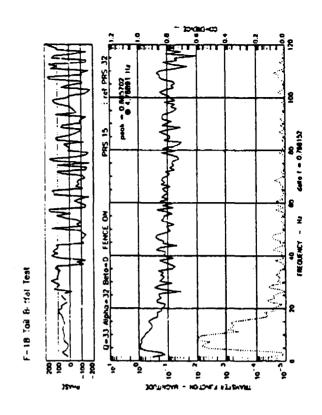


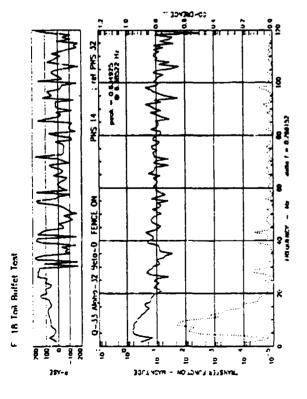


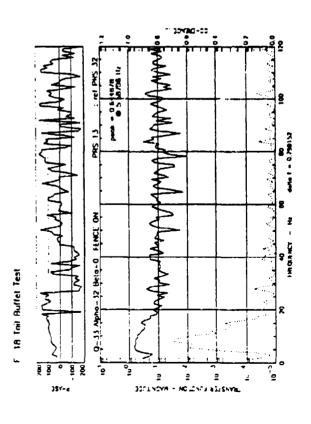


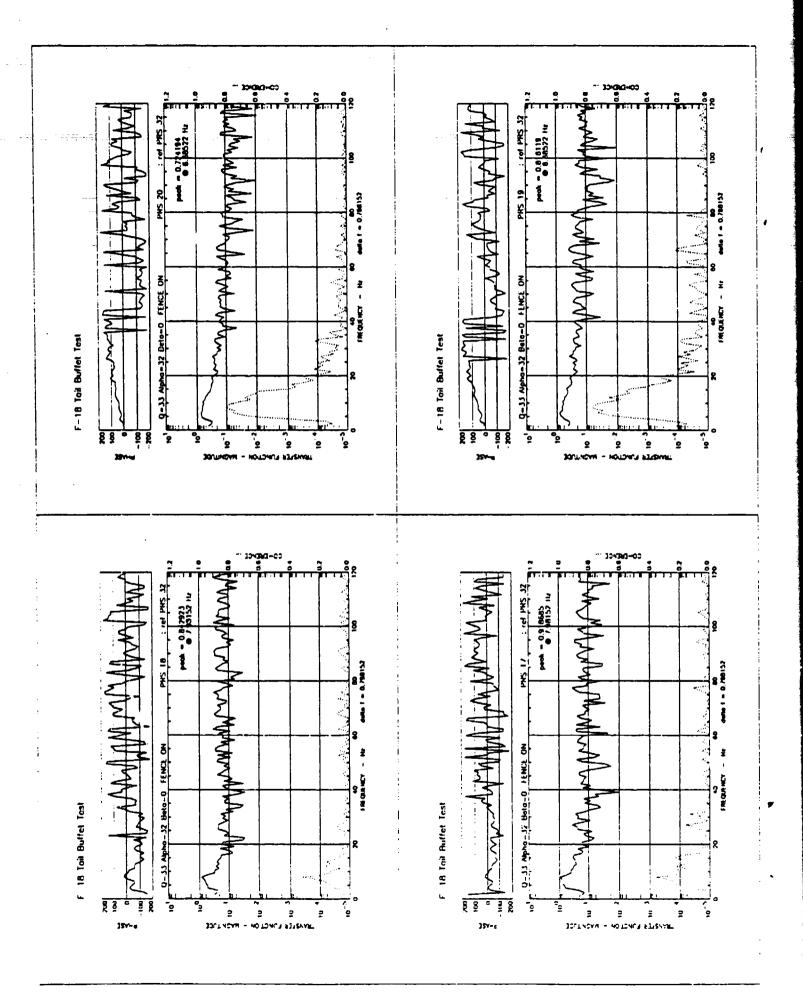


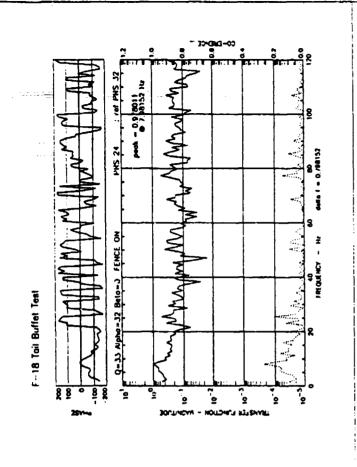


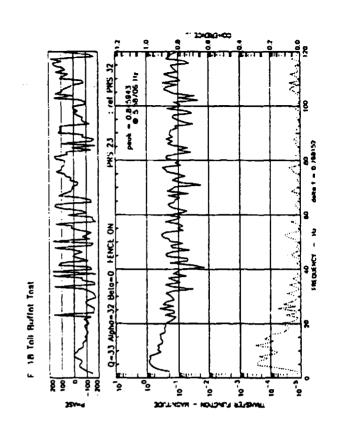


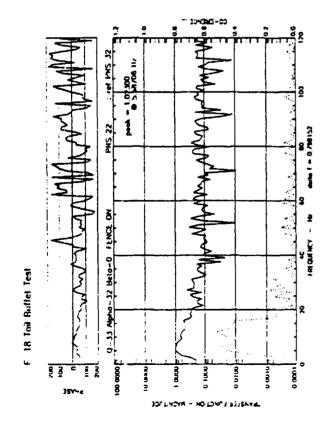


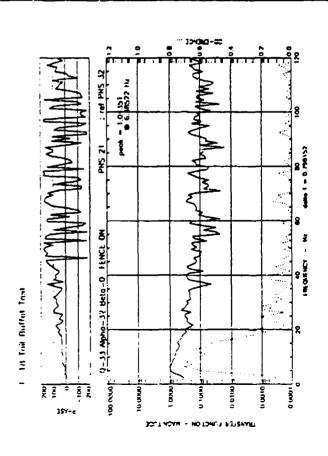


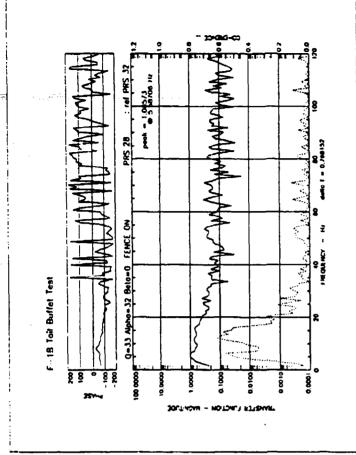


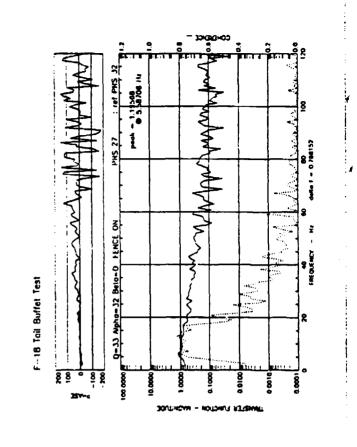


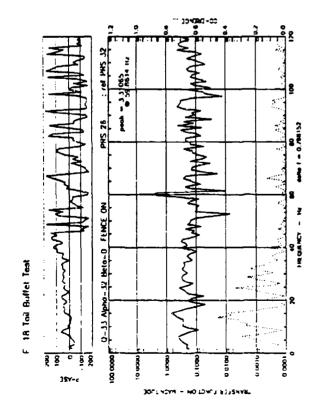


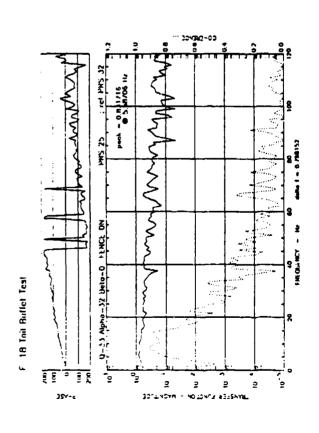


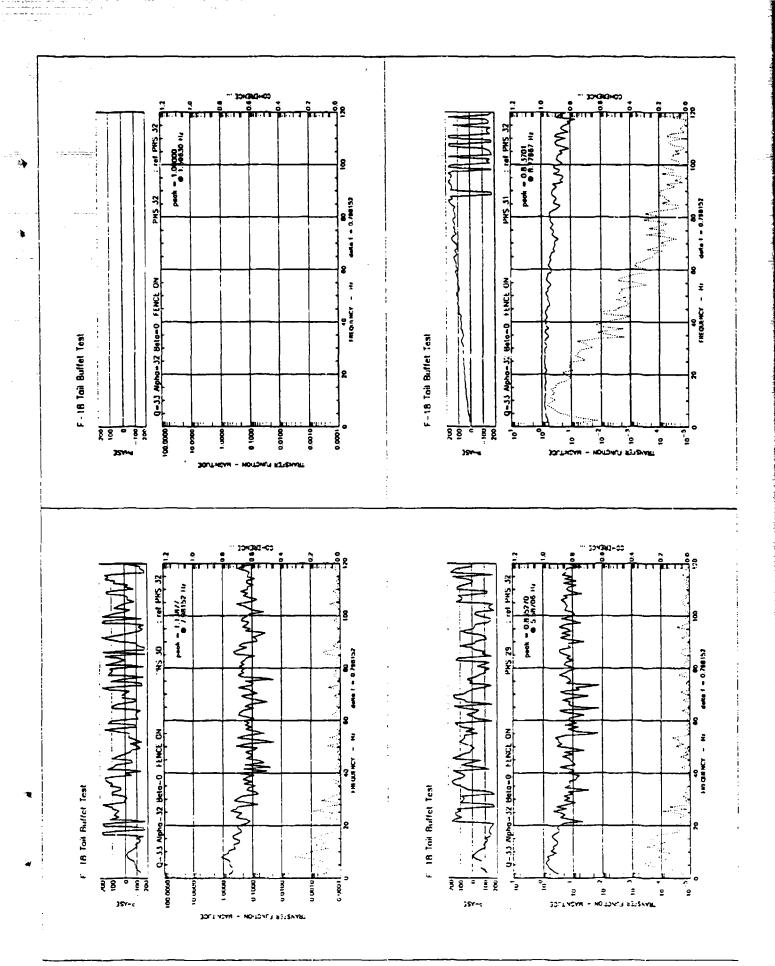


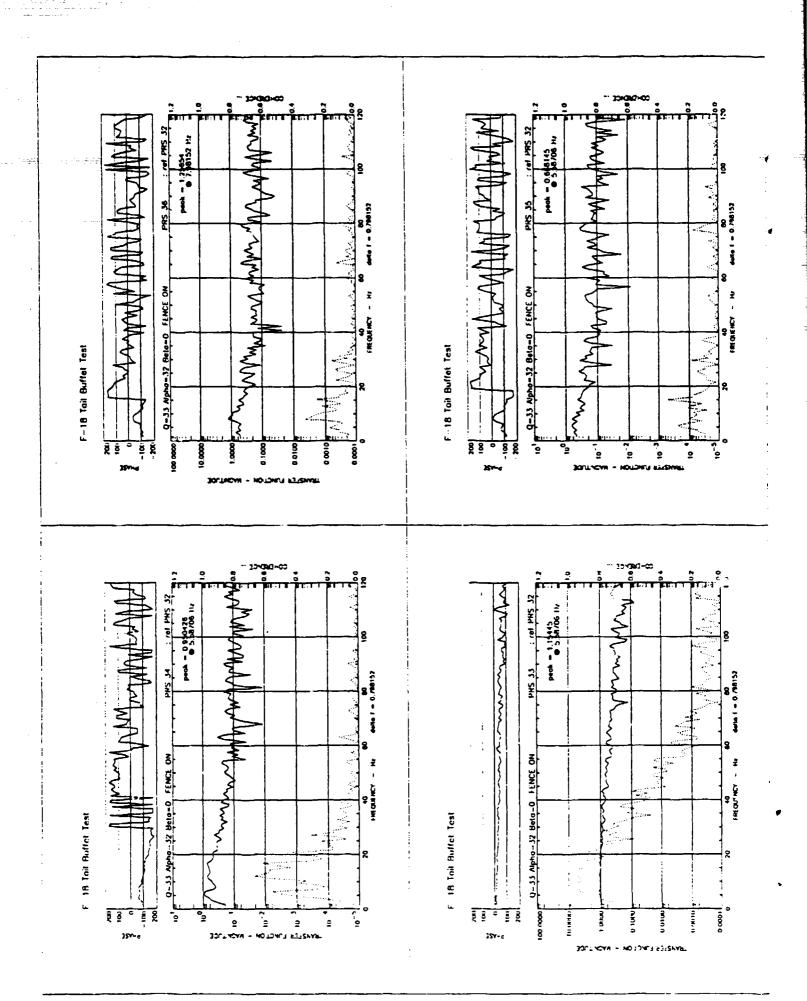


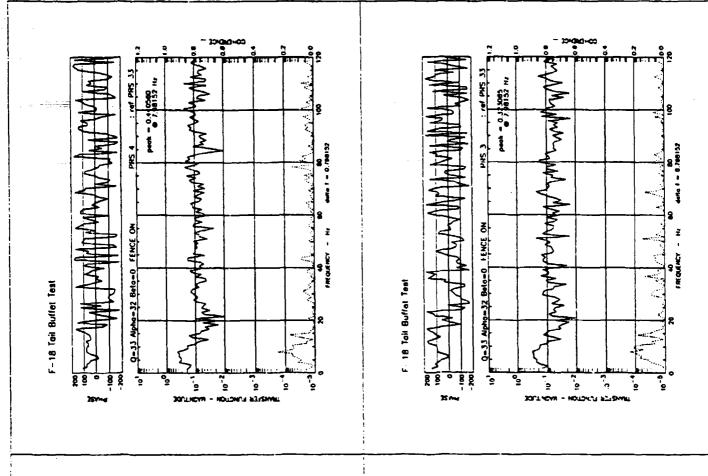


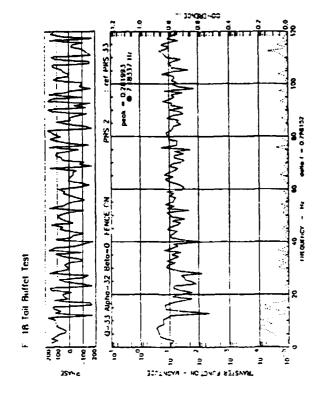


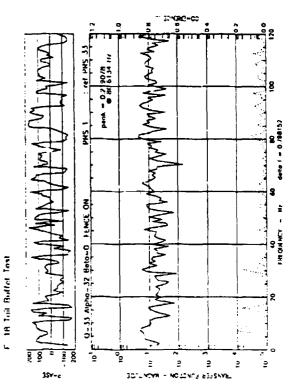


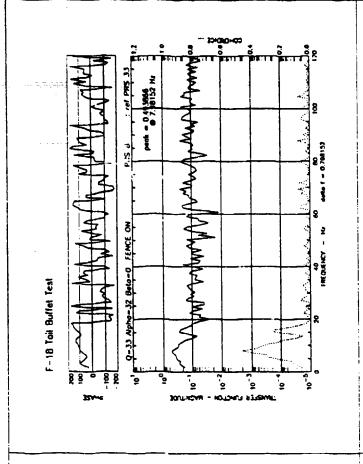


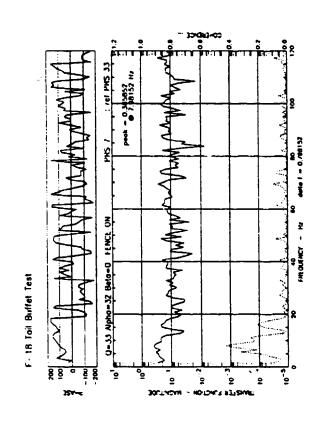


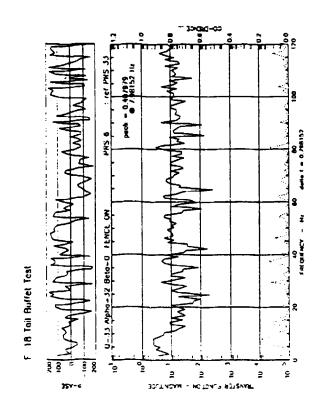


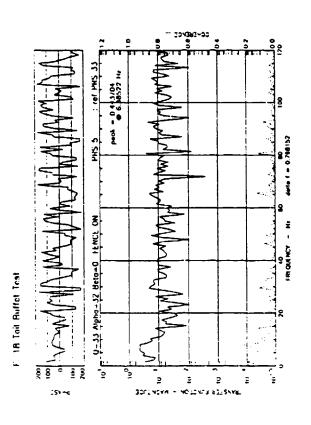


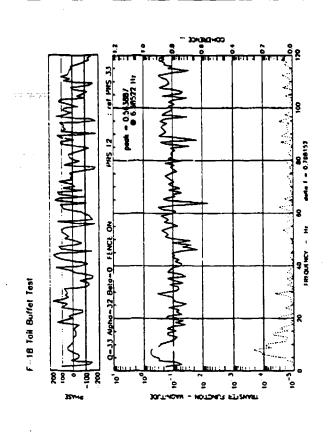


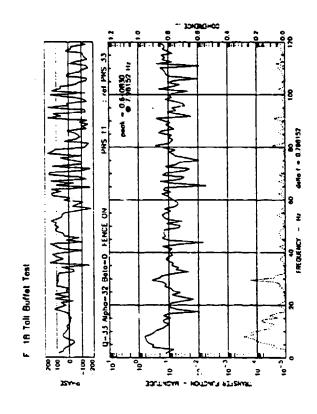


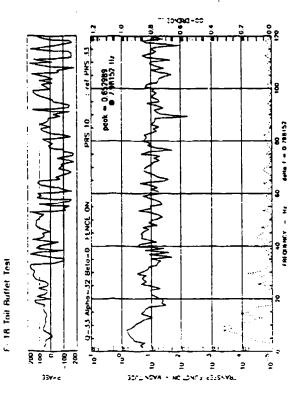


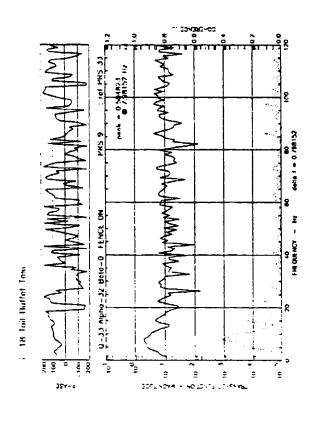


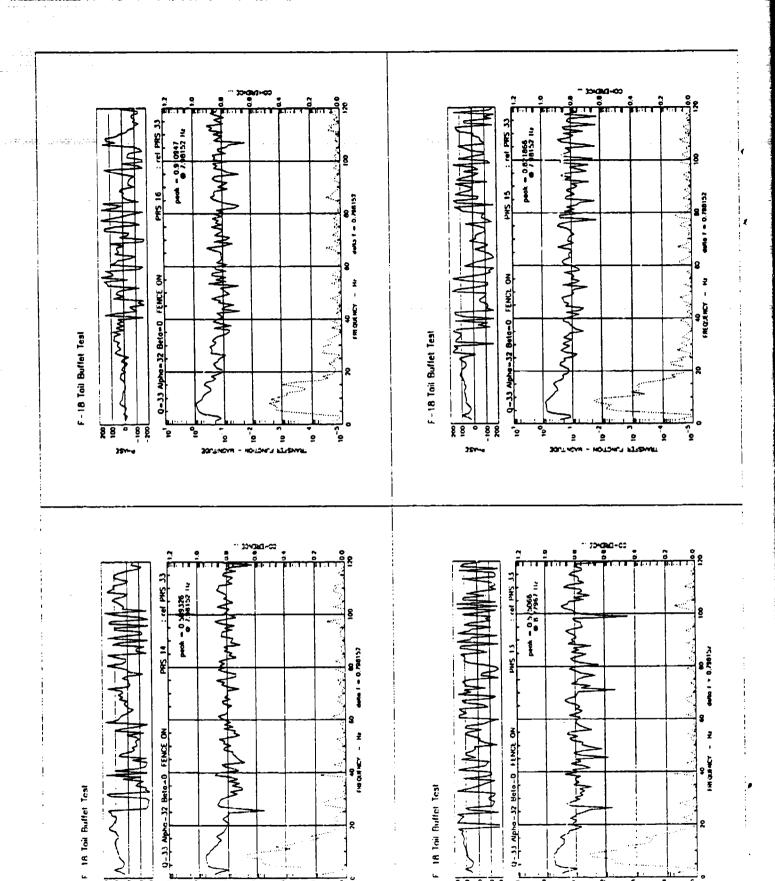












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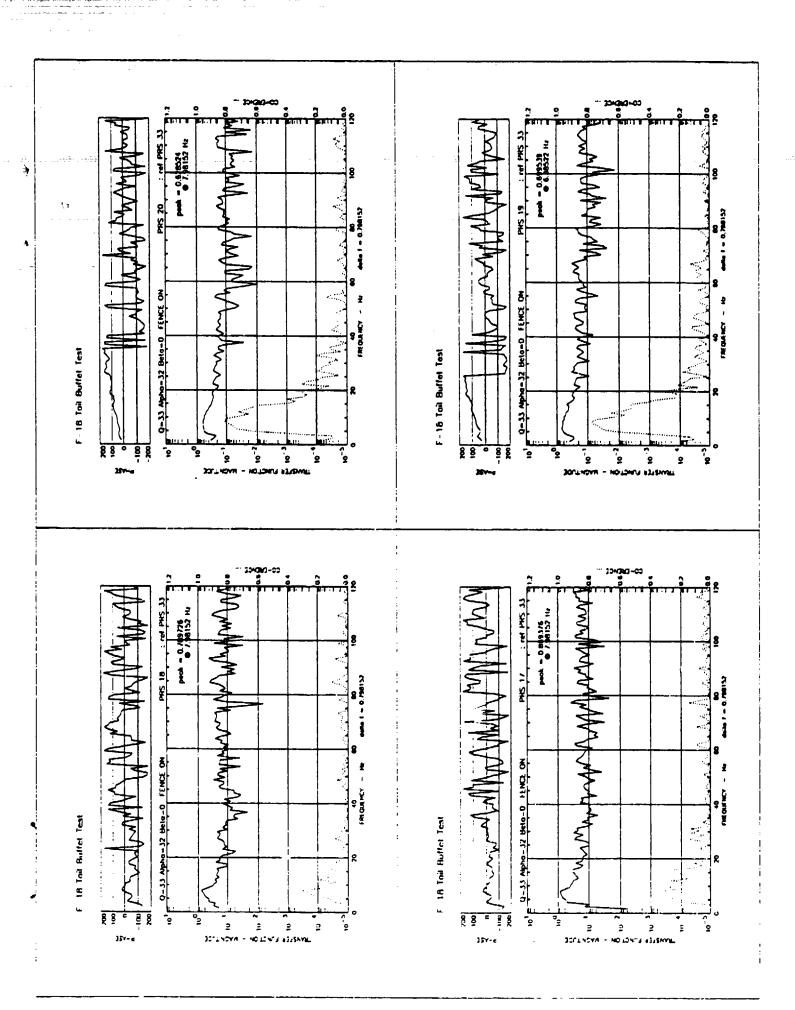
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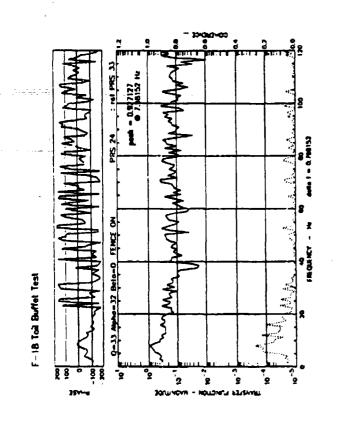
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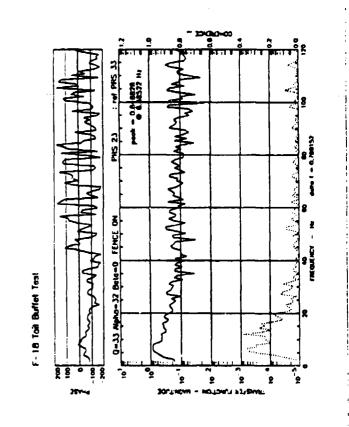
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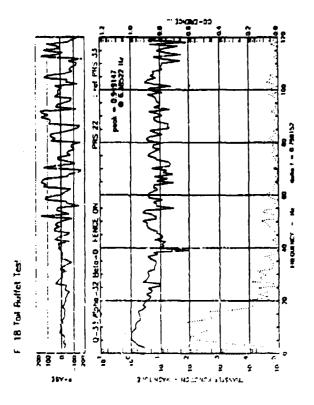
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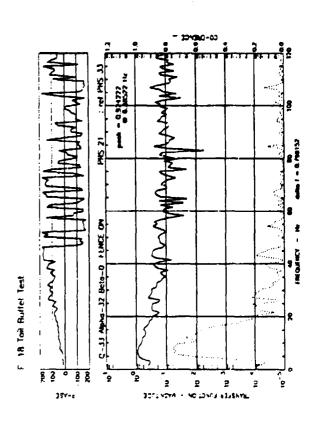
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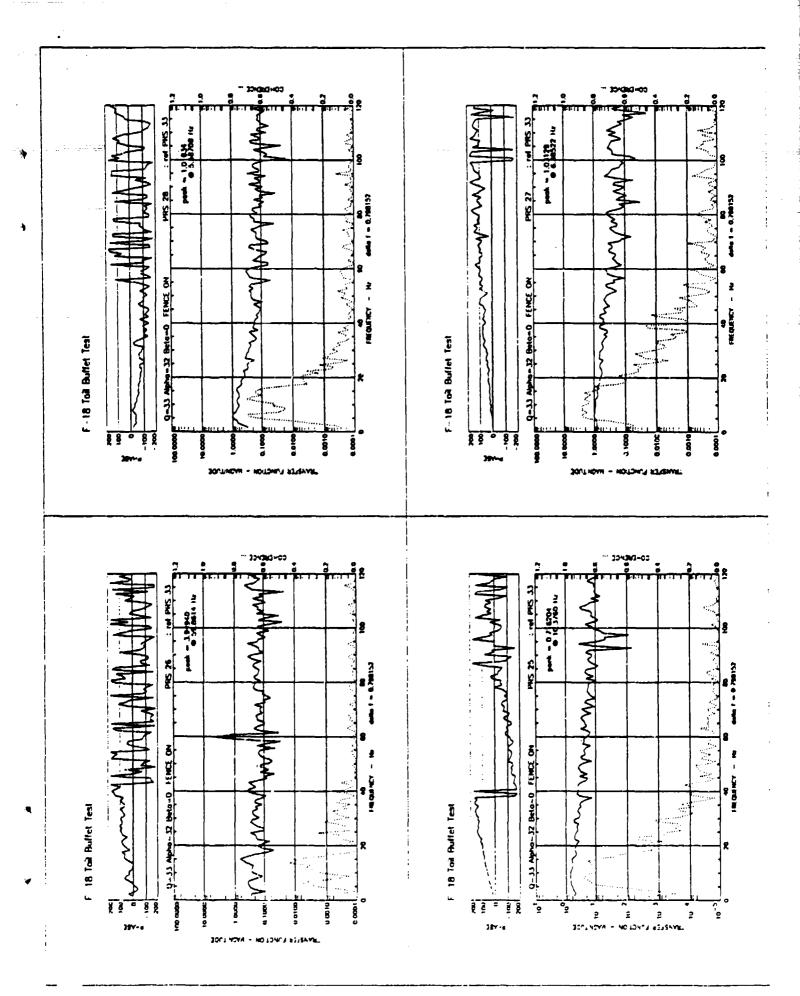


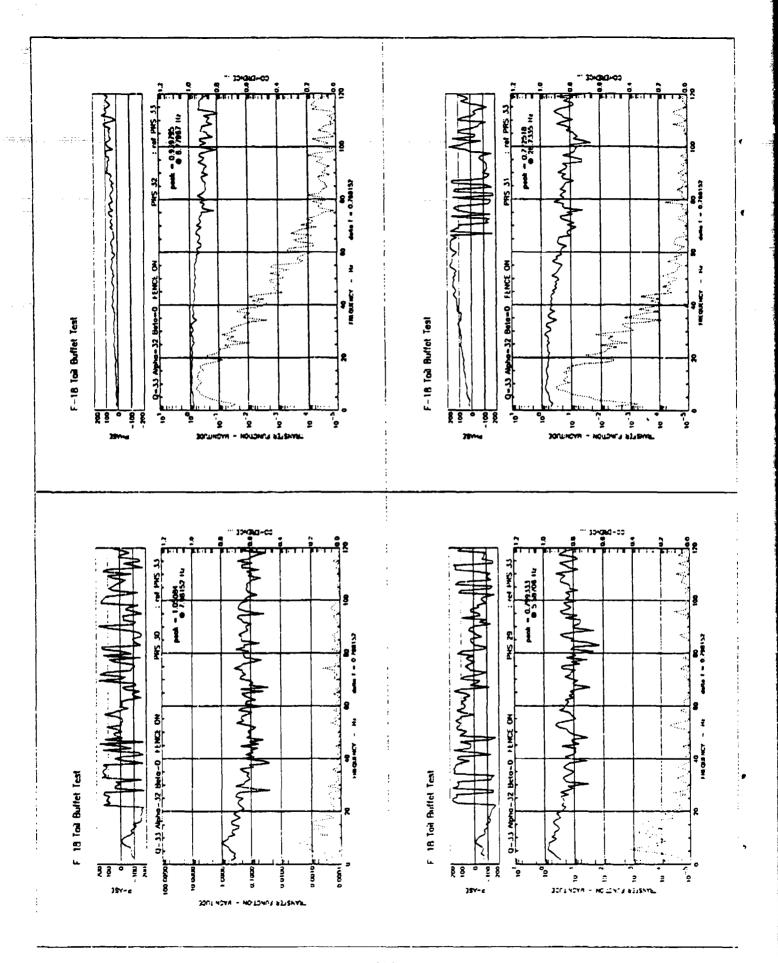


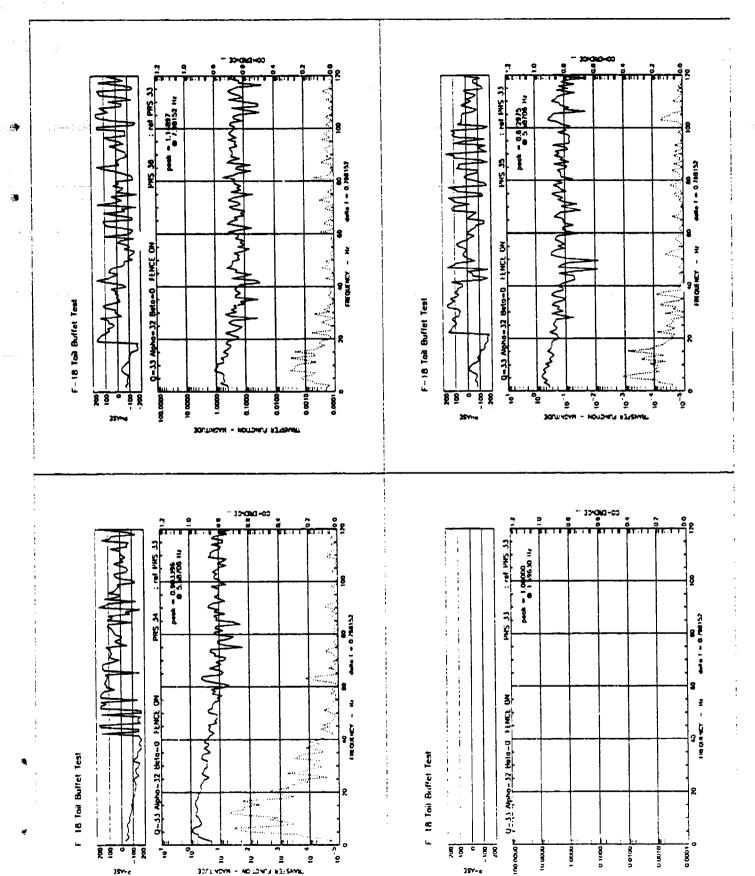










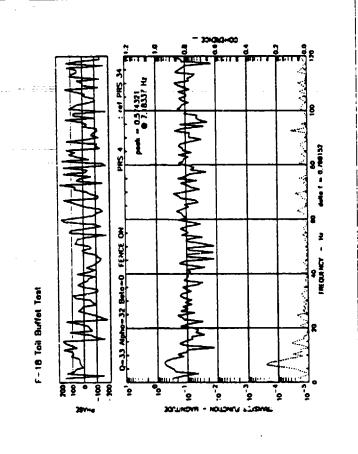


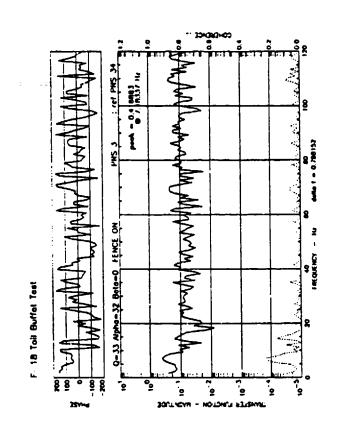
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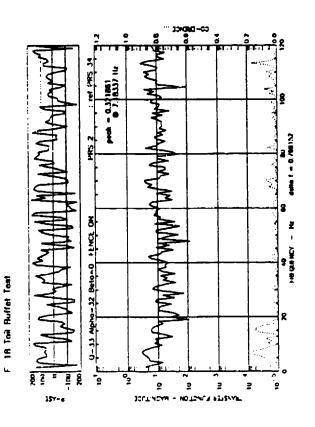
BOTH HOME - NO LONG & BUSHING

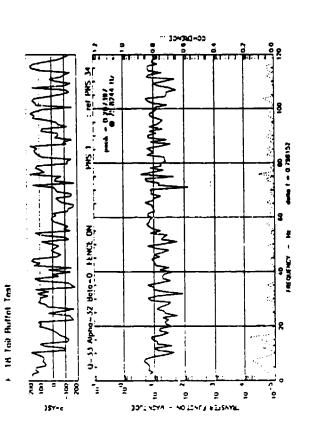
BOLL NOW - NO POWLY PERSON

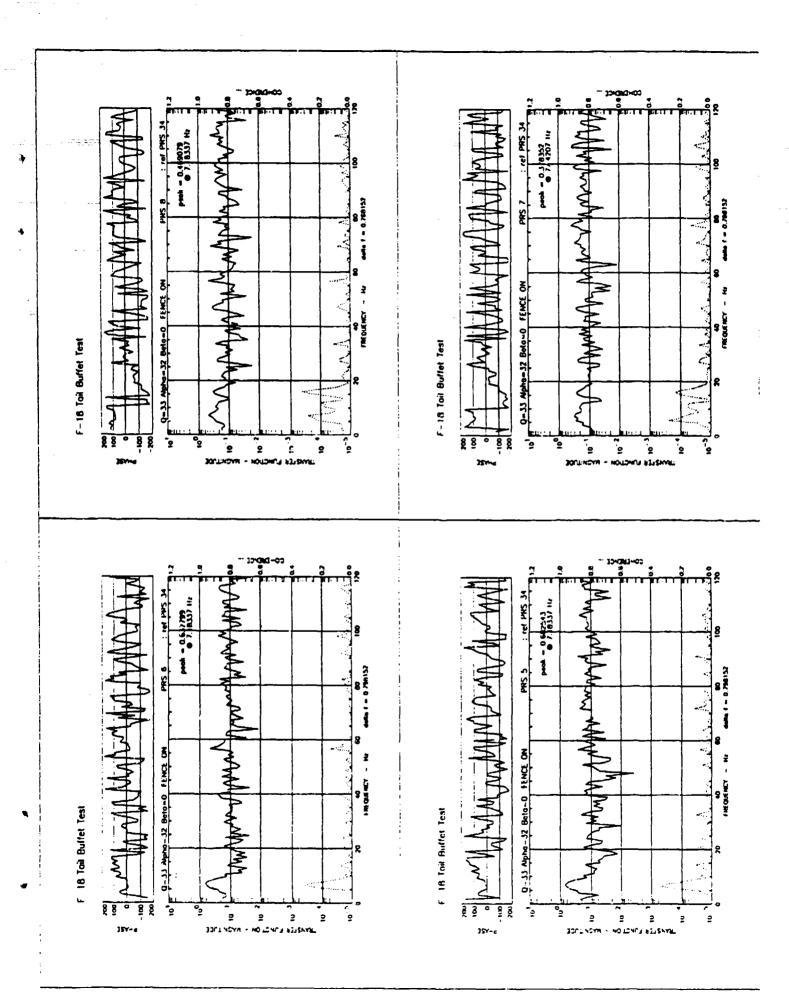
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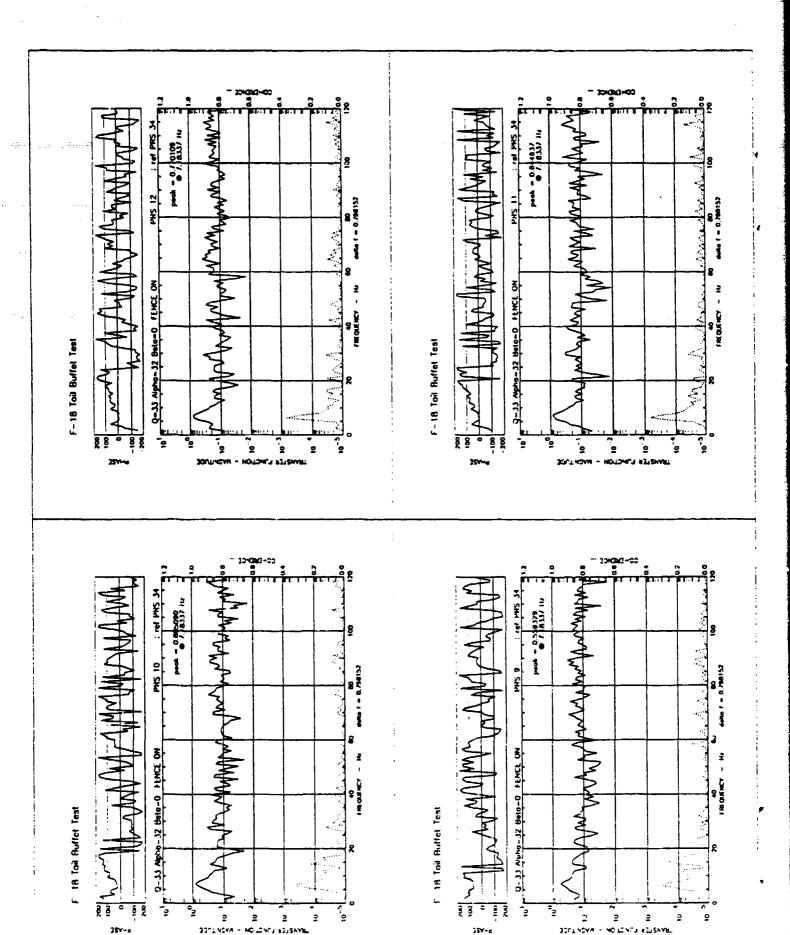


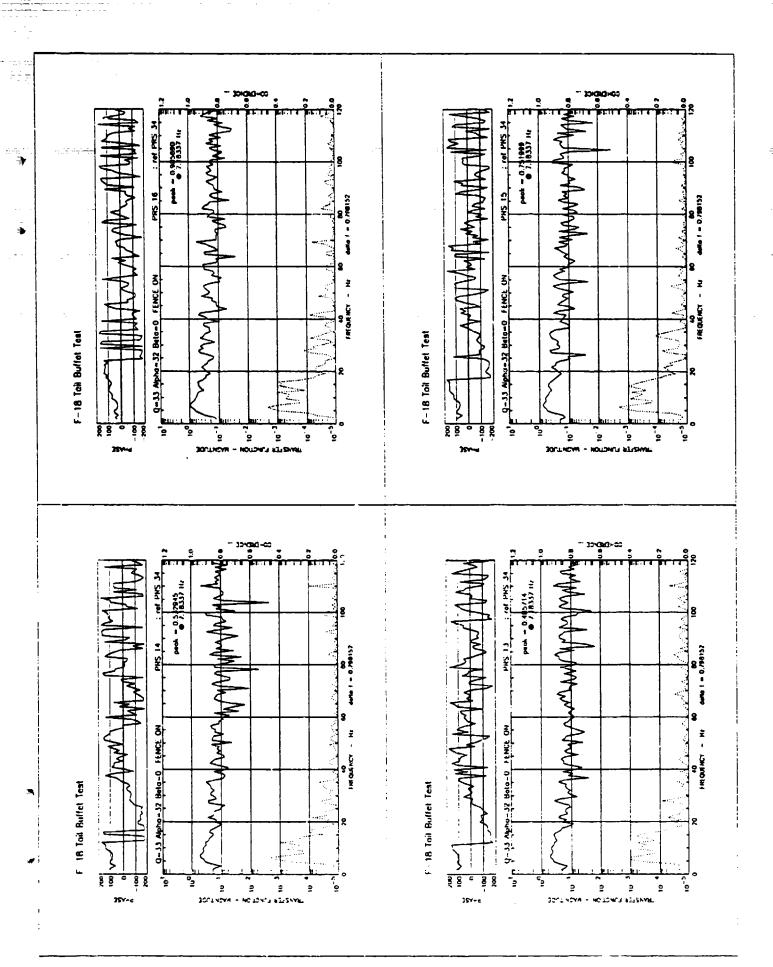


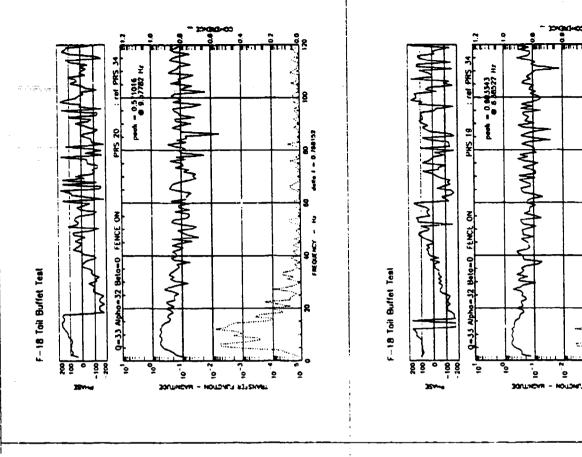


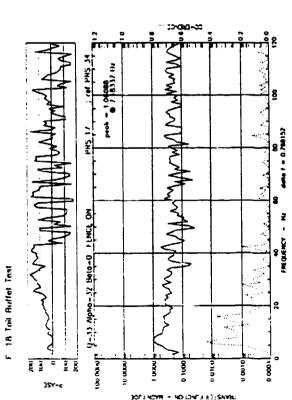


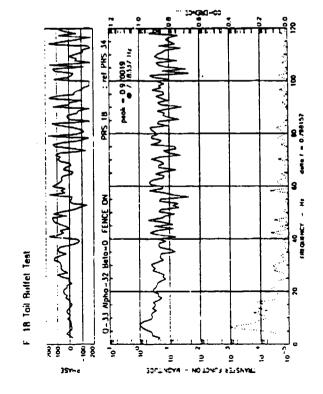


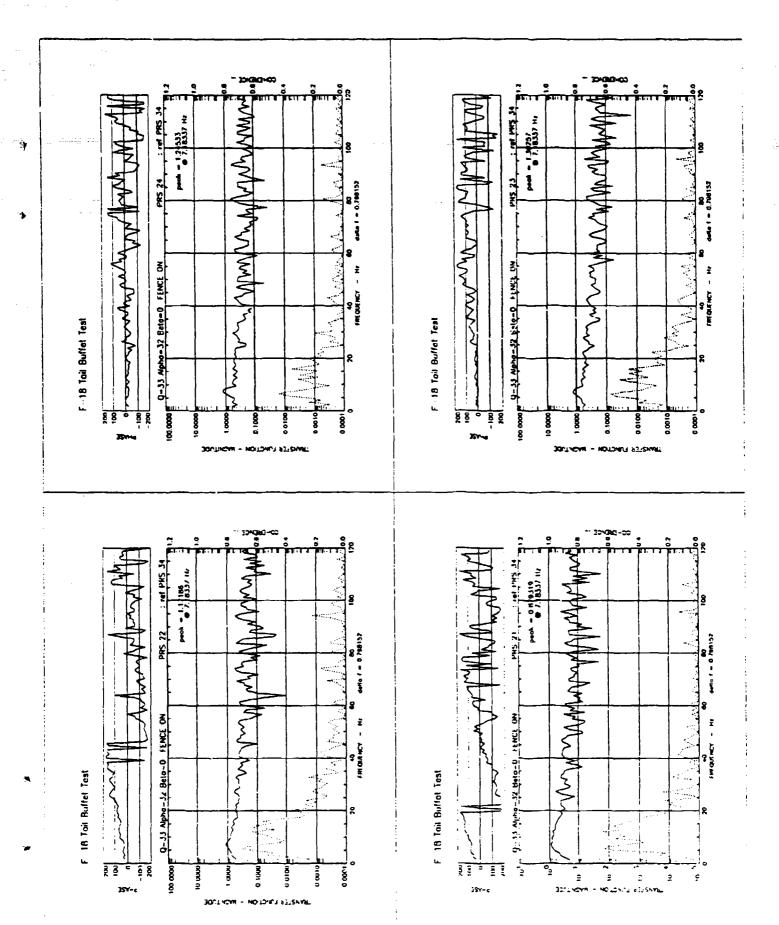


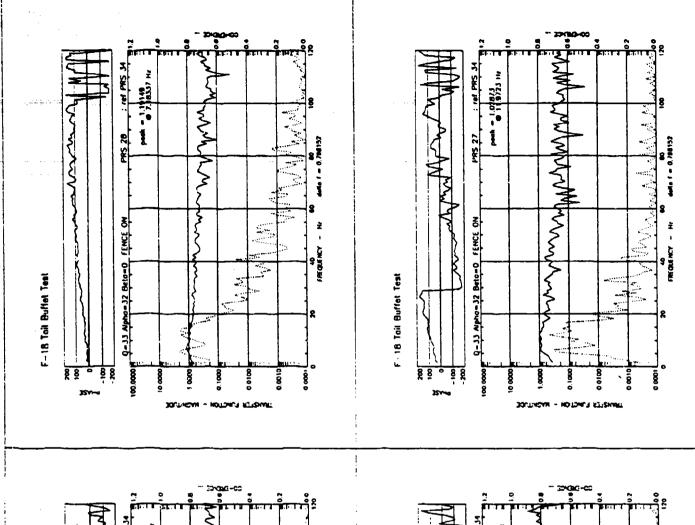


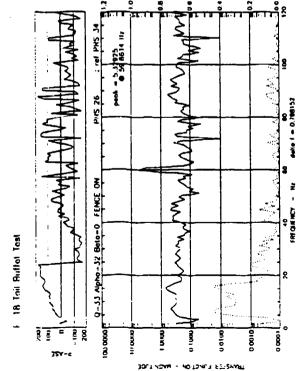


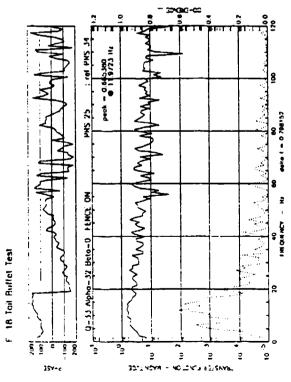


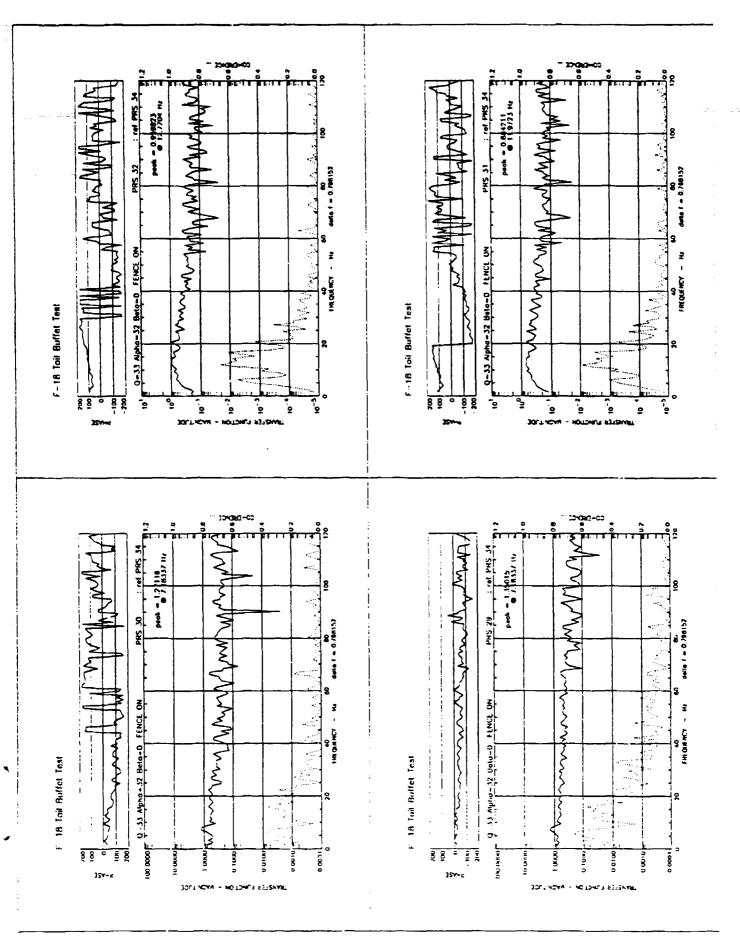


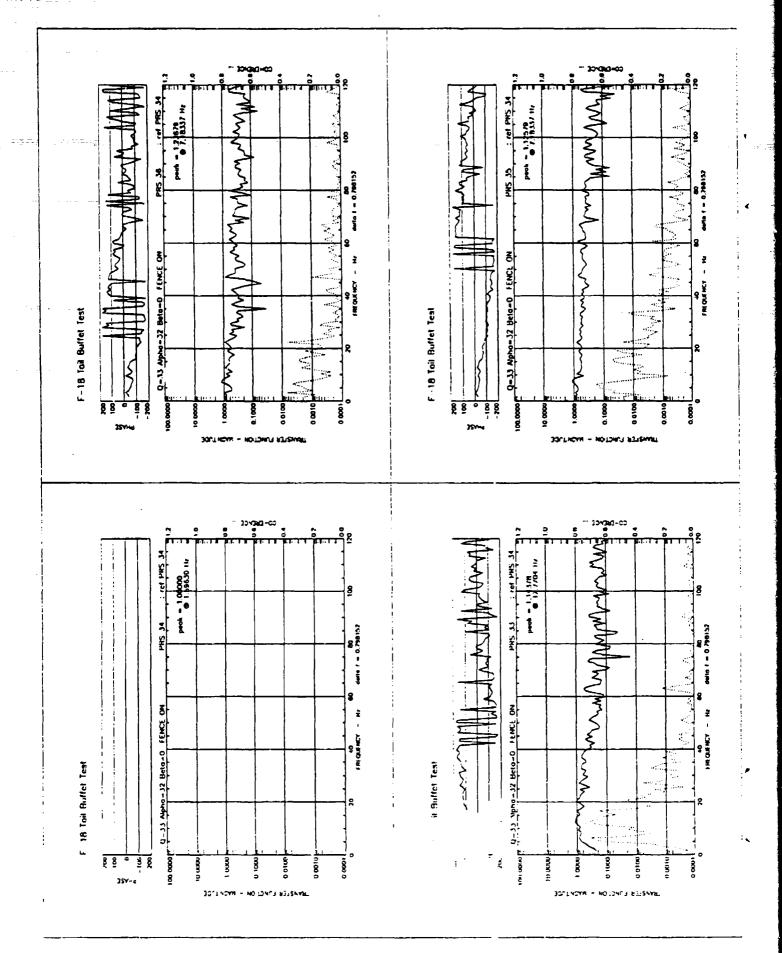


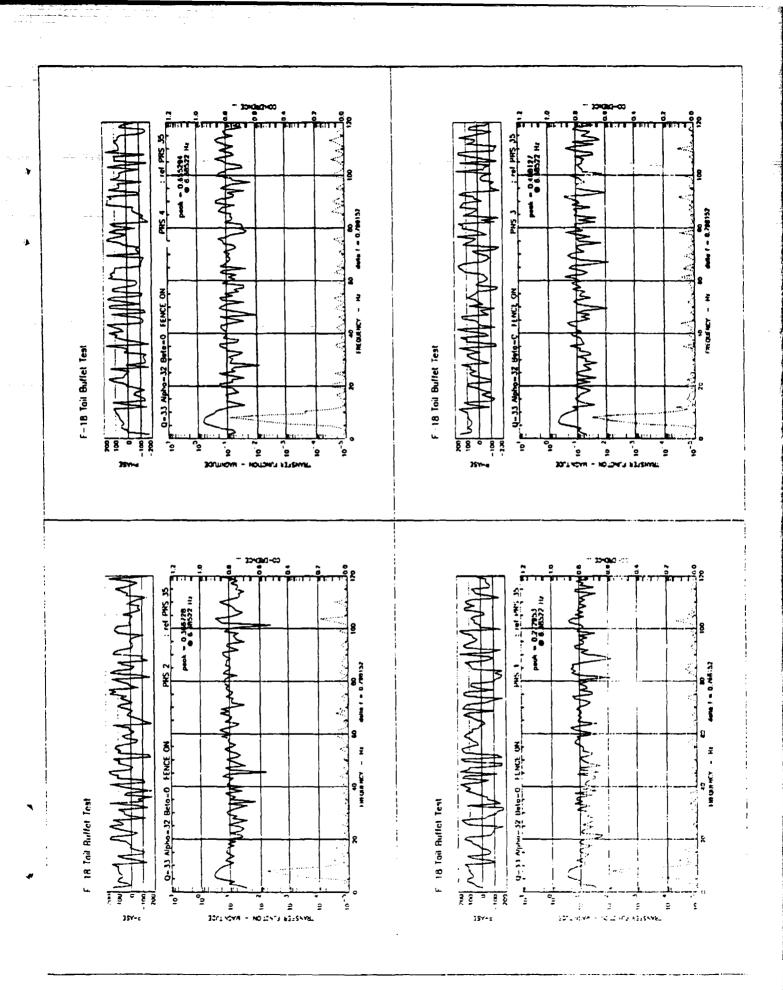


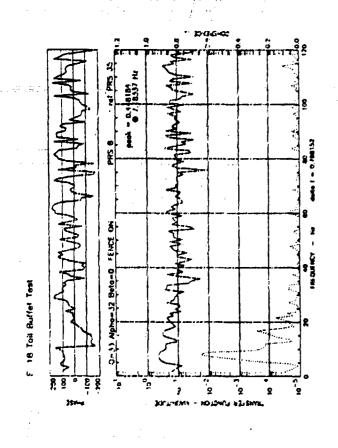


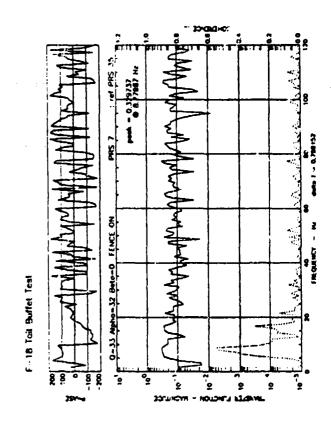


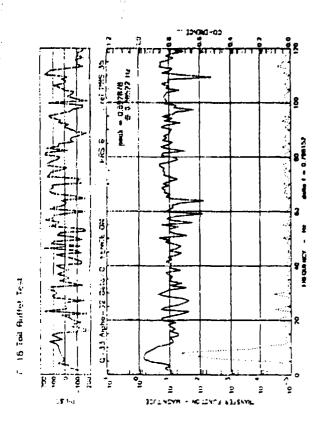


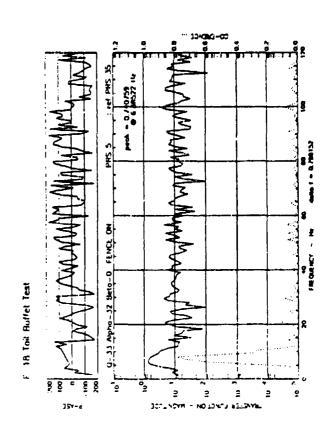


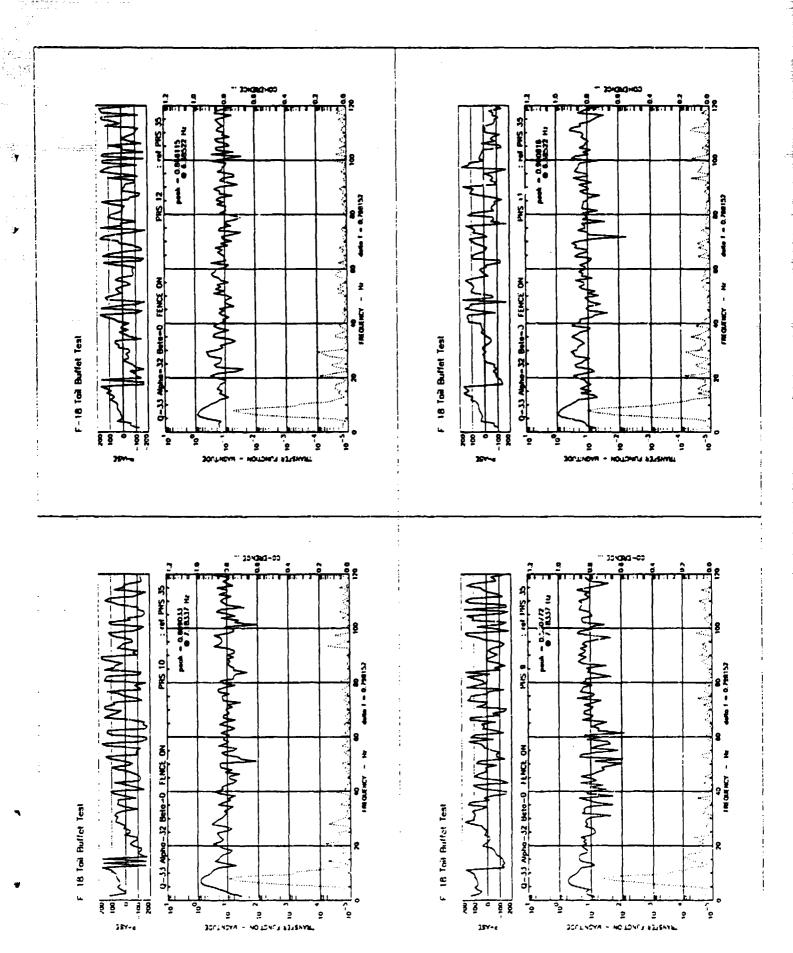


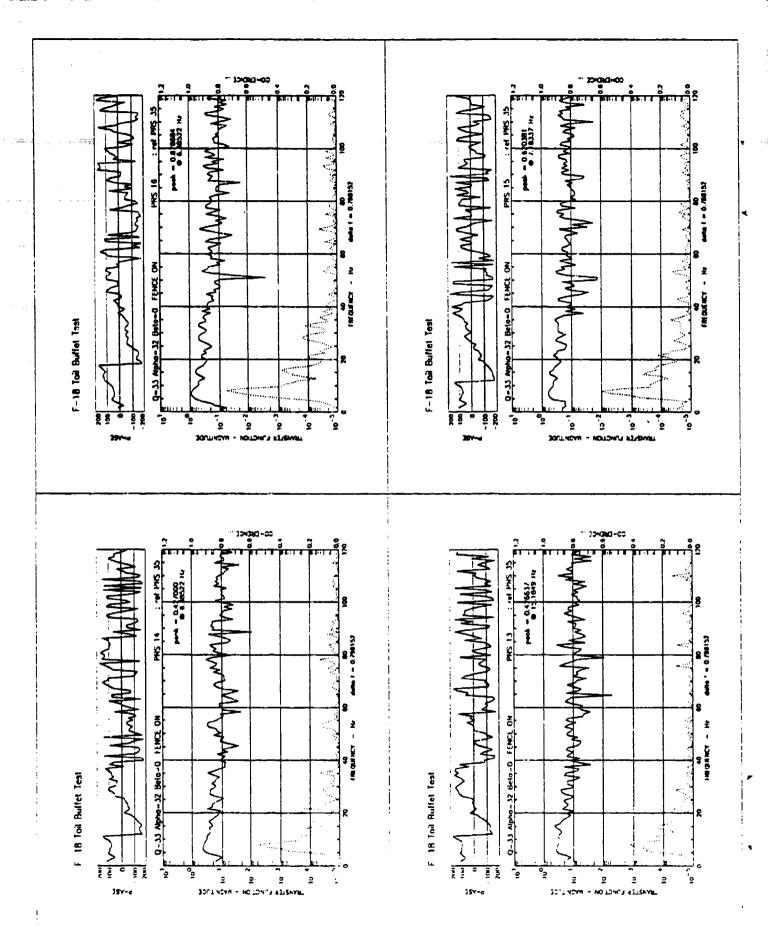


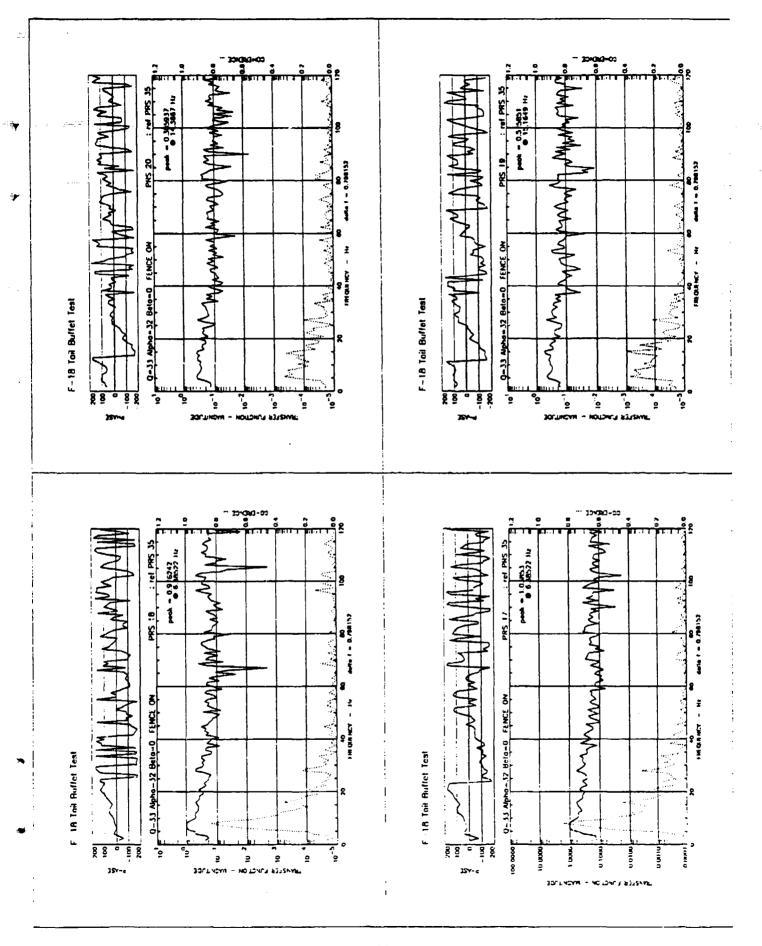


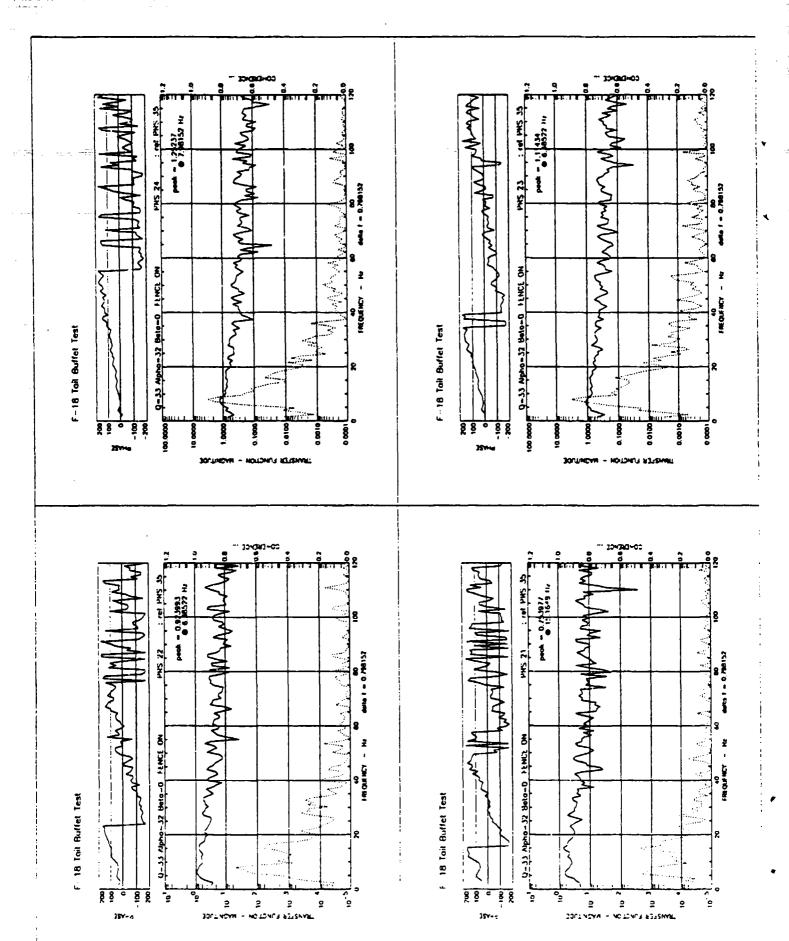


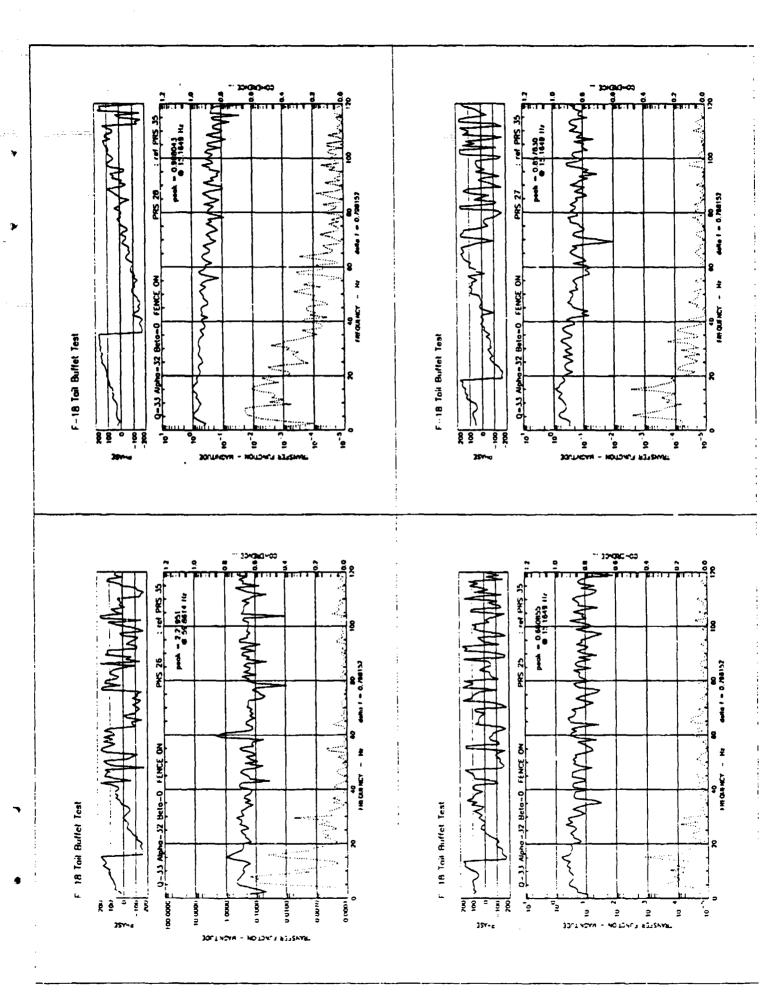


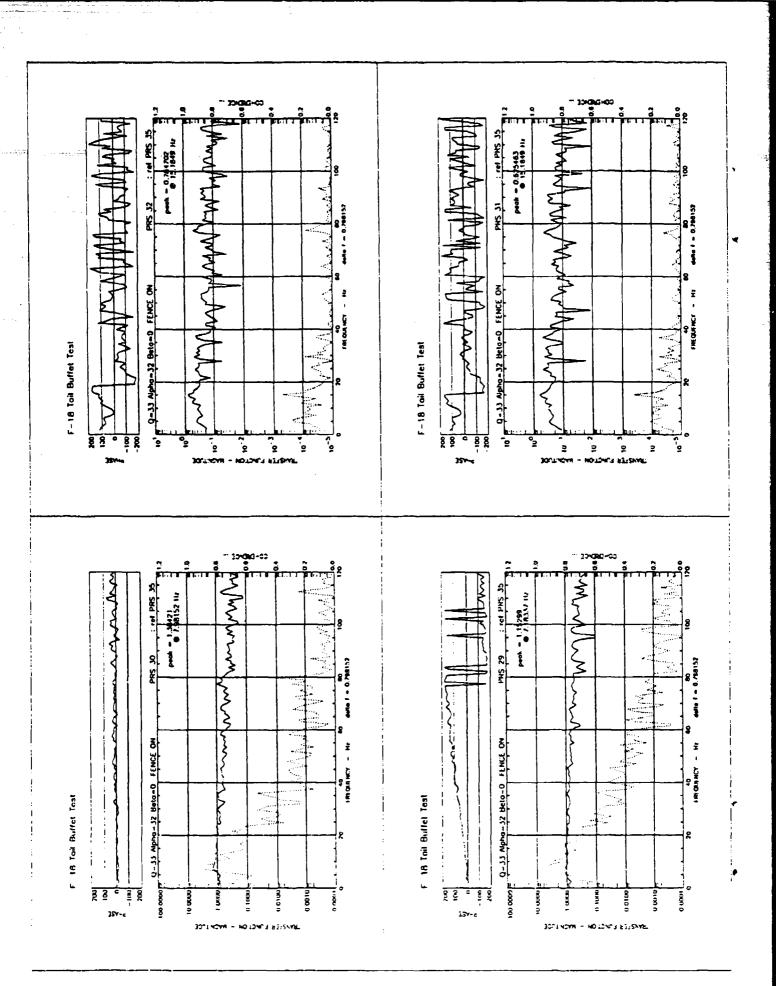


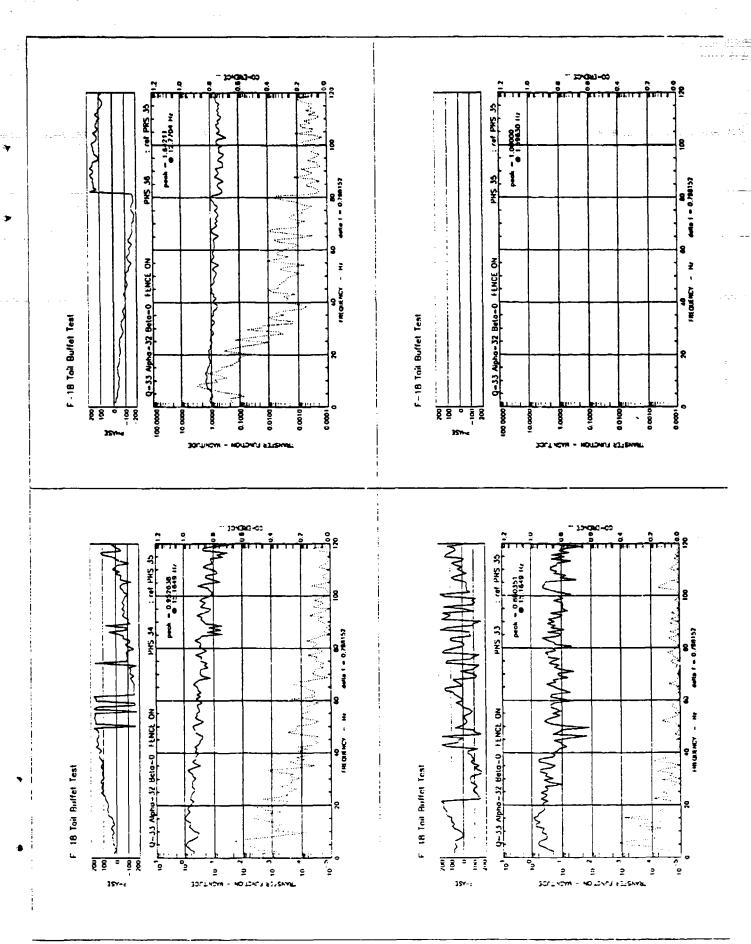


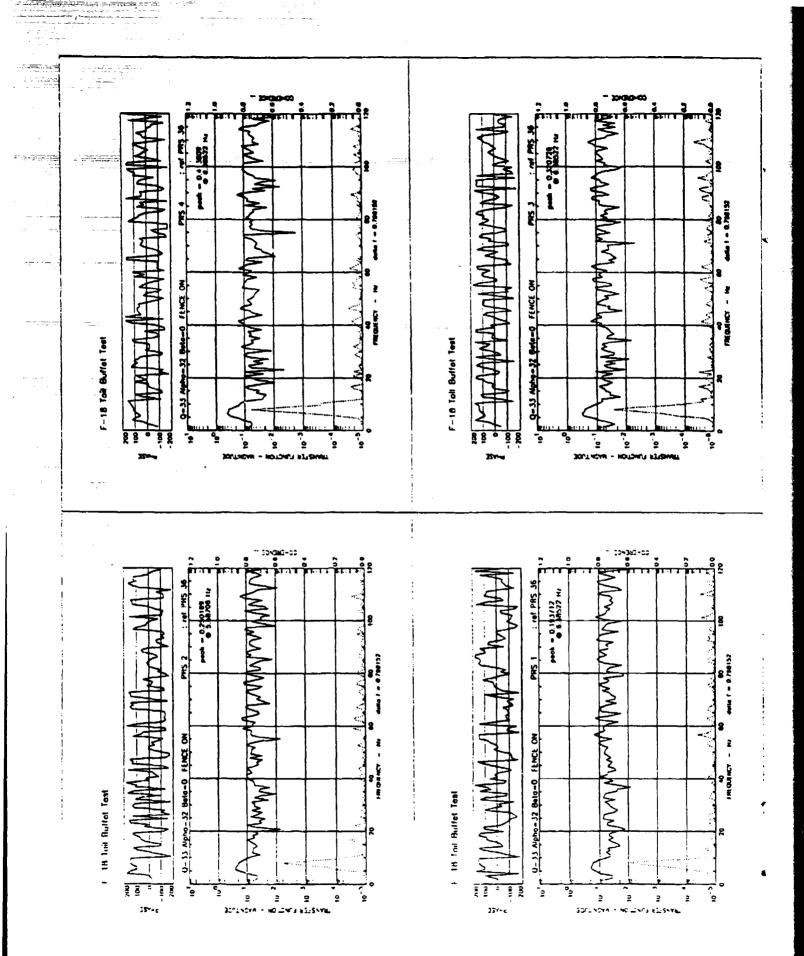


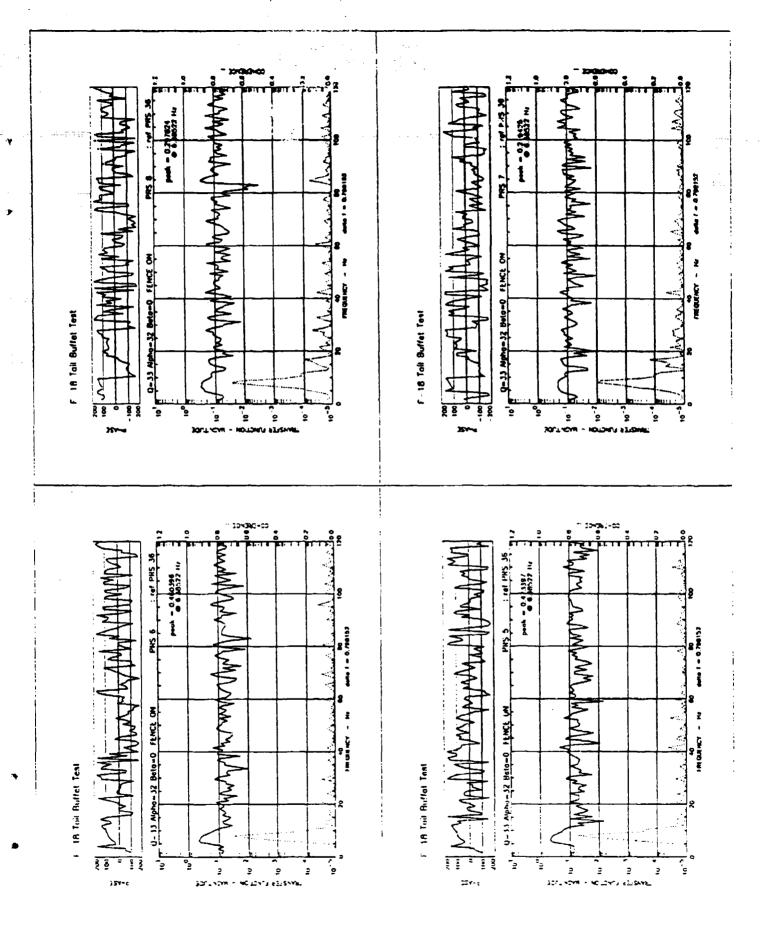


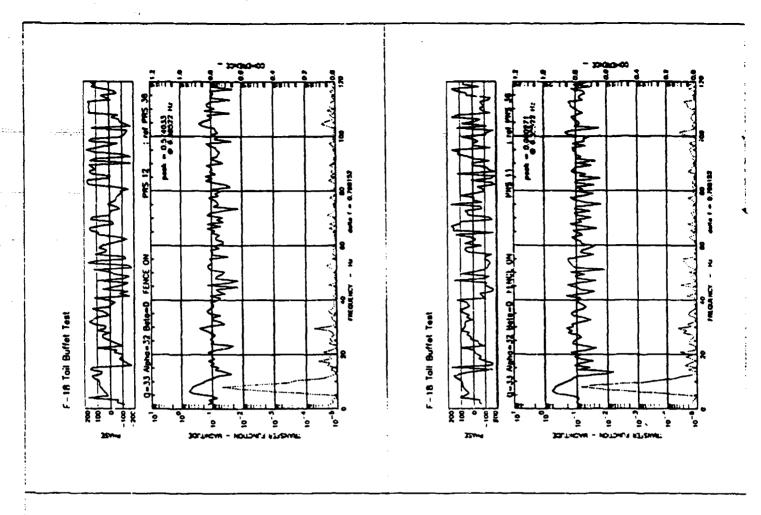


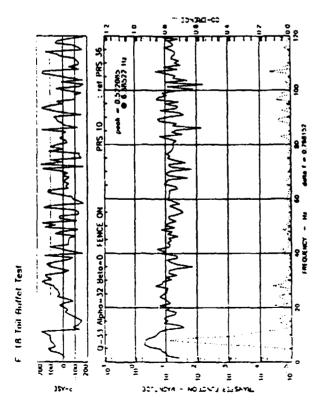


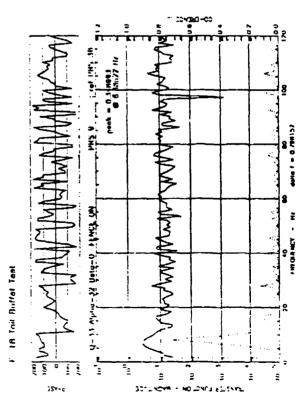


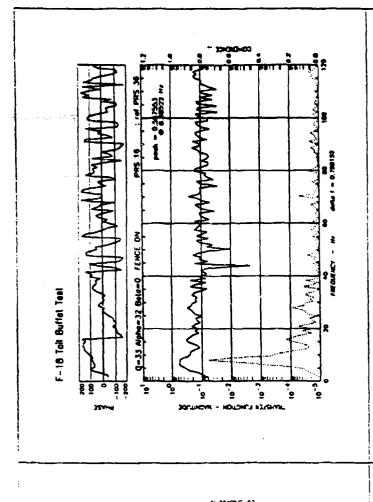


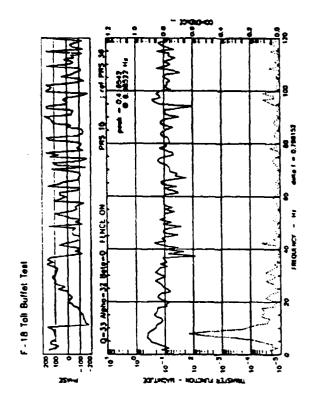


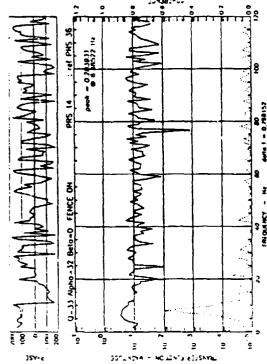




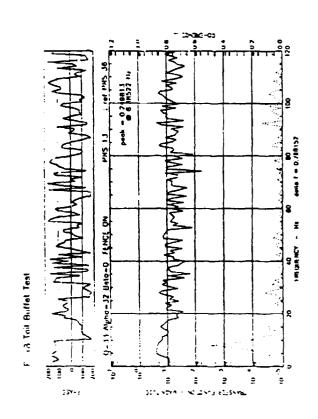


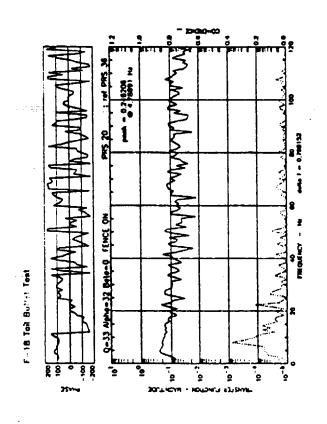


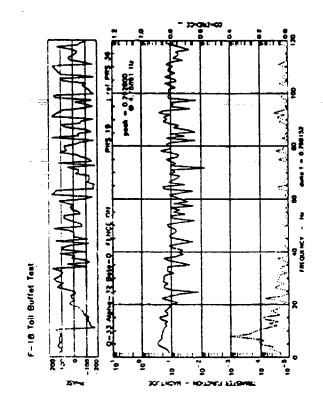


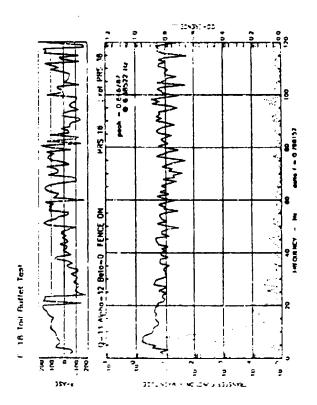


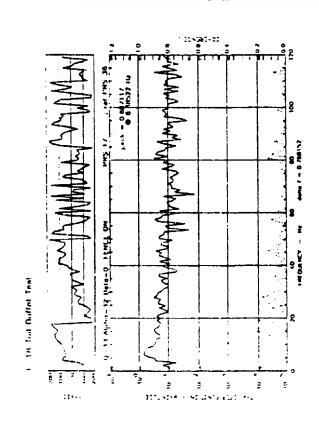
1 18 lost Buffet Test

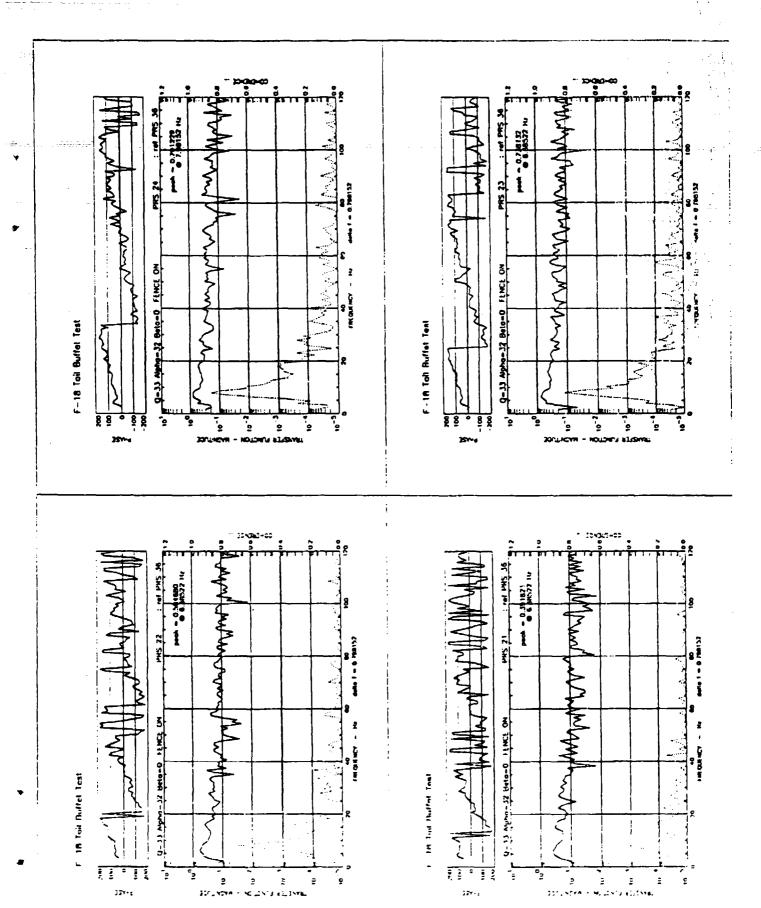


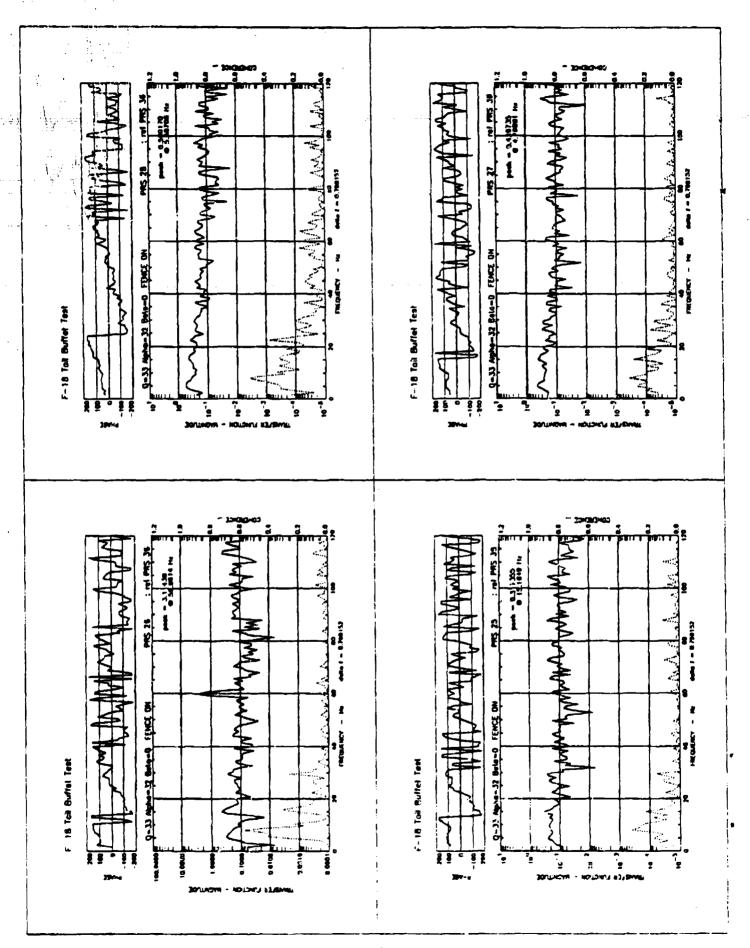


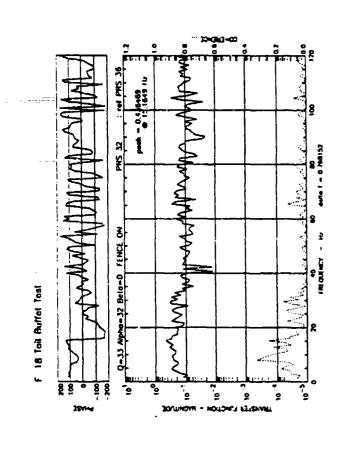


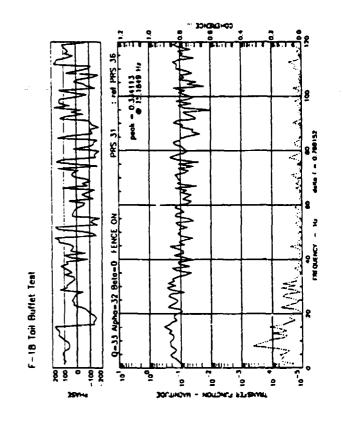


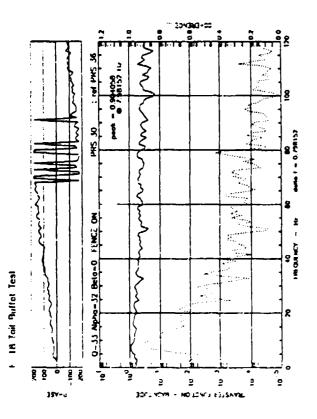


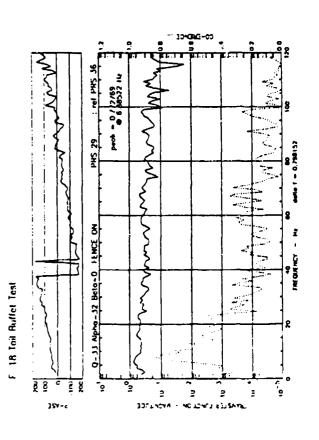


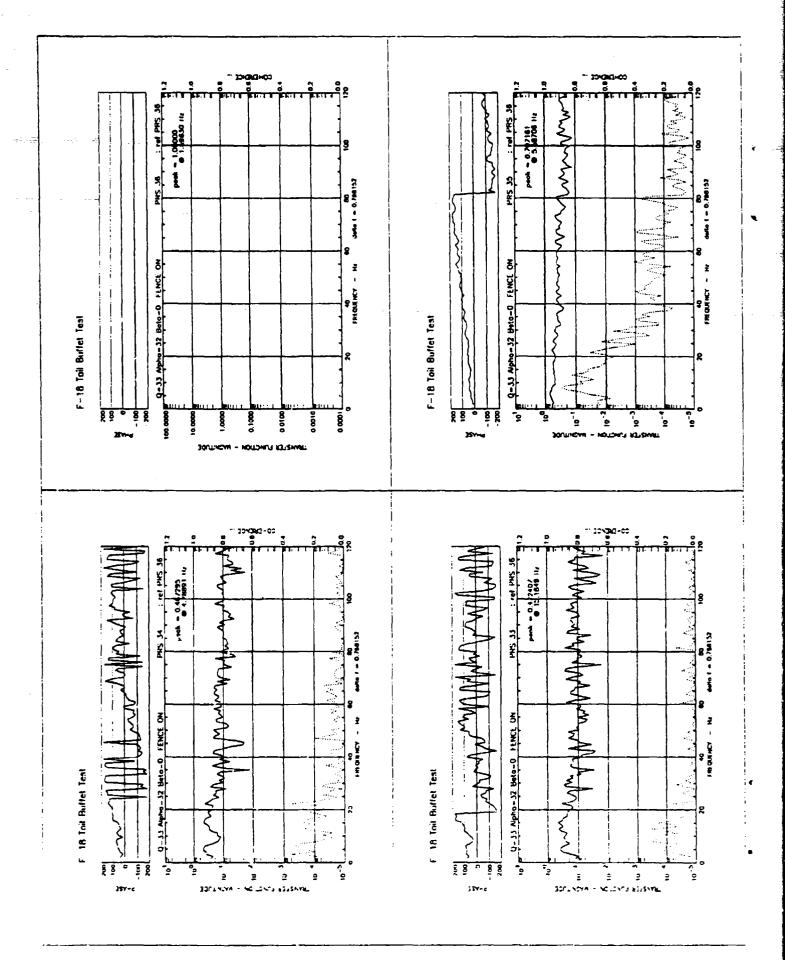












Cross Spectral Densities between Inside and Outside Surface Pressures at Each Transducer Station

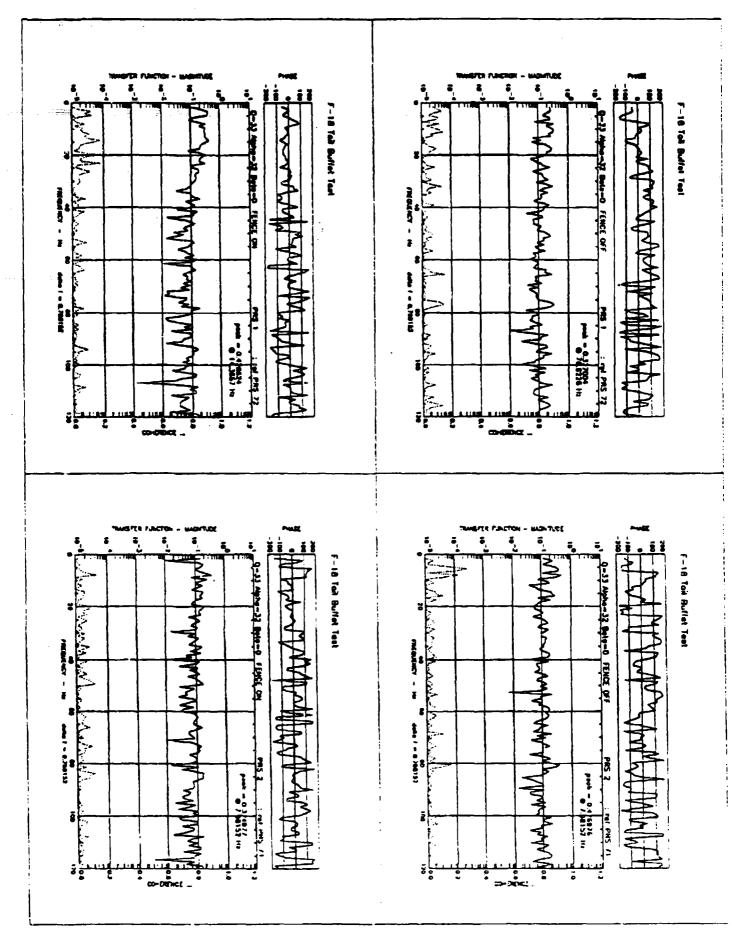
$$\alpha = 32^{\circ}, \beta = 0^{\circ}, Q = 33 psf$$

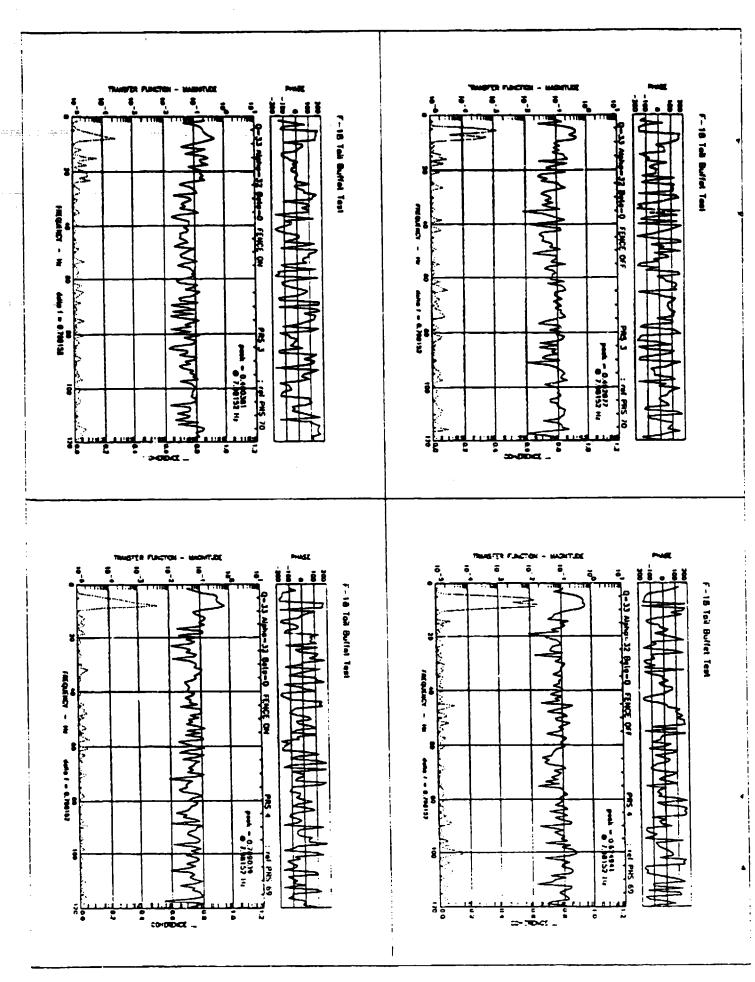
LEX fence OFF and ON plots are displayed in the top and bottom halves of the page, respectively. Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers whose signals are being compared are listed near the upper right of each chart. Refer to the transducer reference numbers displayed in Figure 1.

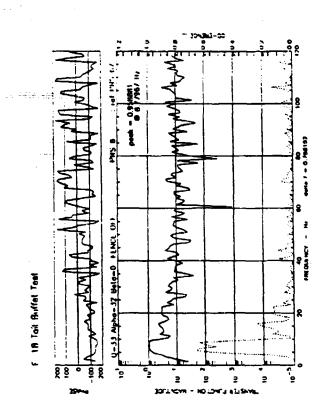
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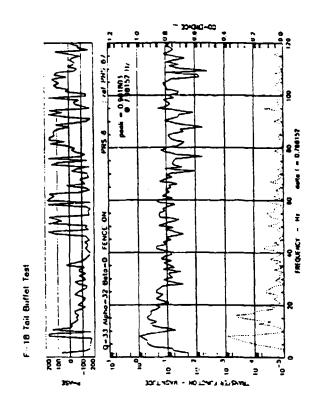
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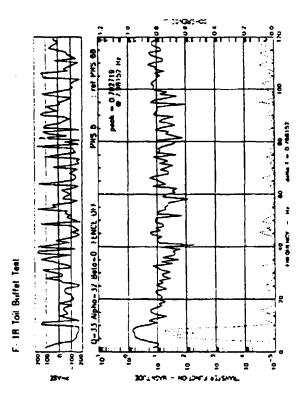
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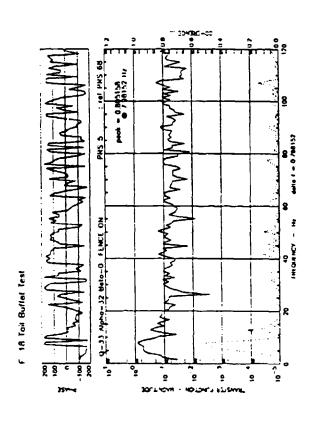


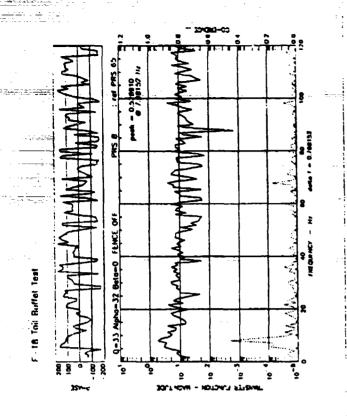


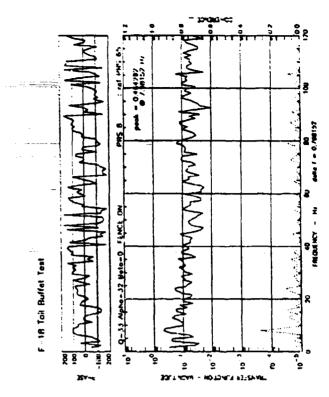


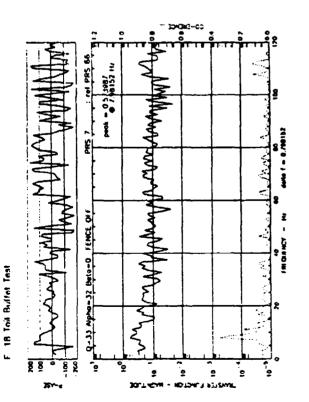


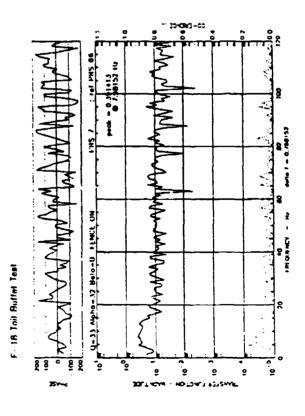


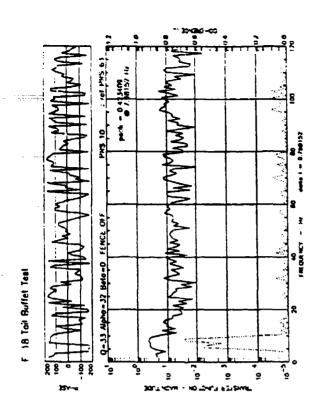


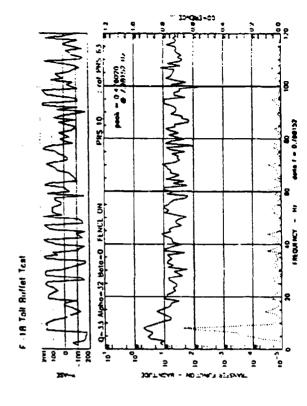


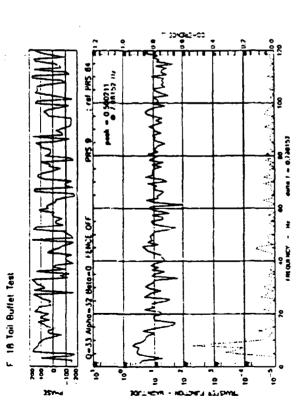


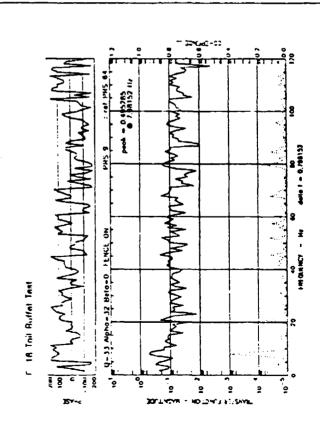


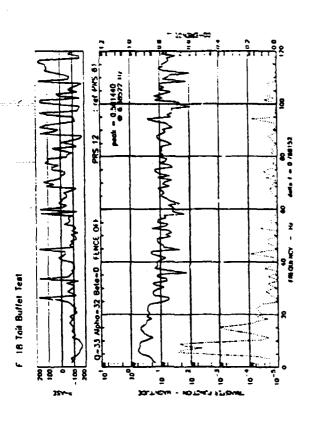


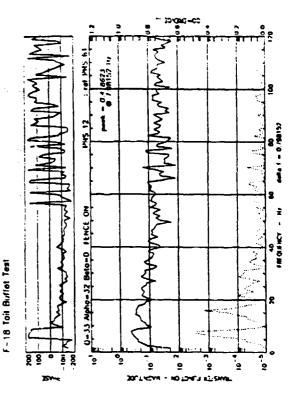


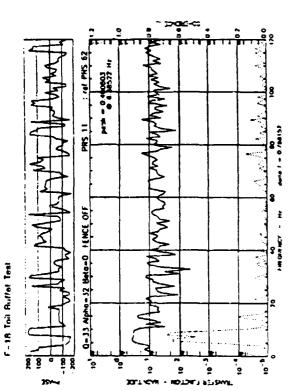


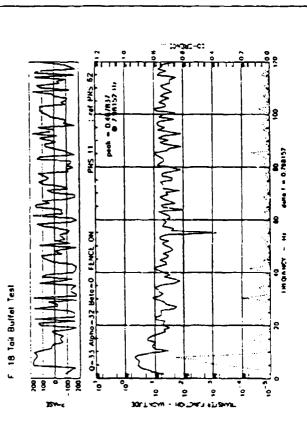


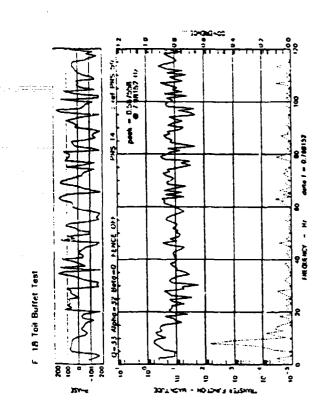


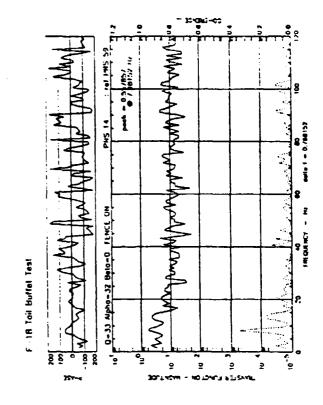


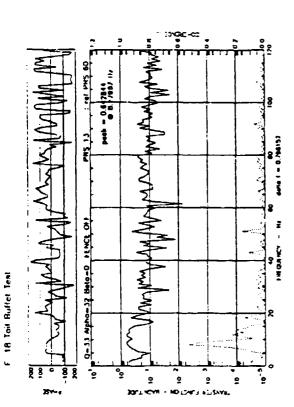


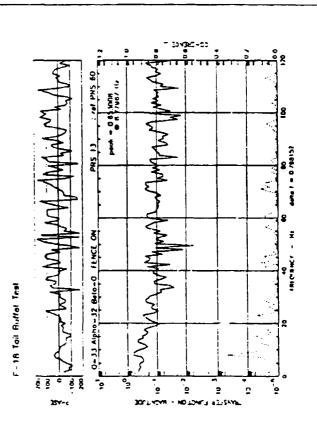


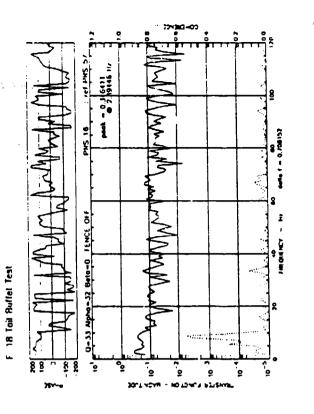


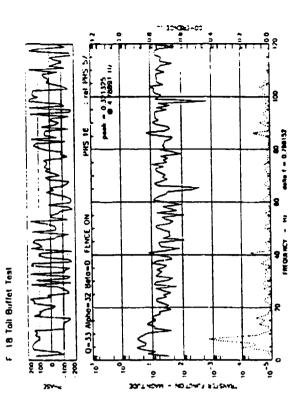


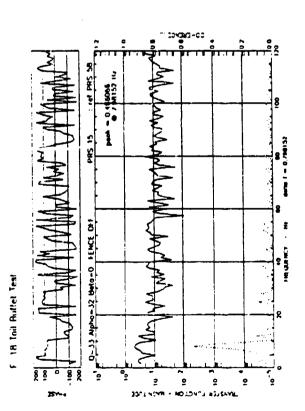


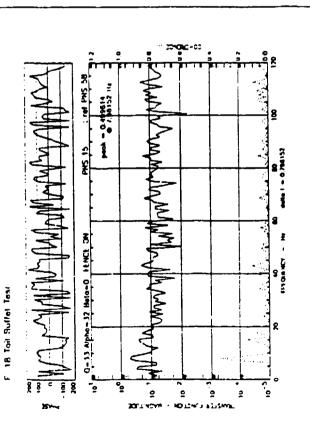


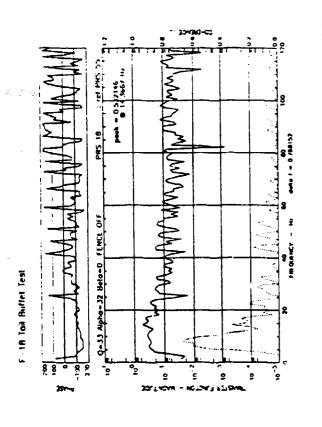


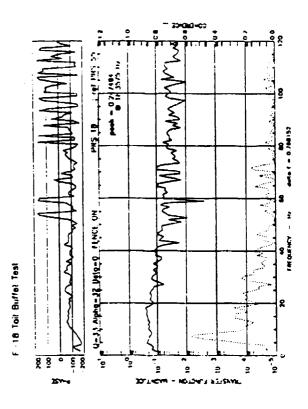


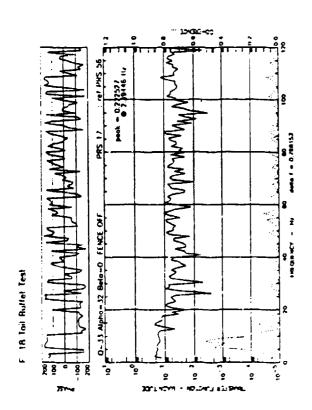


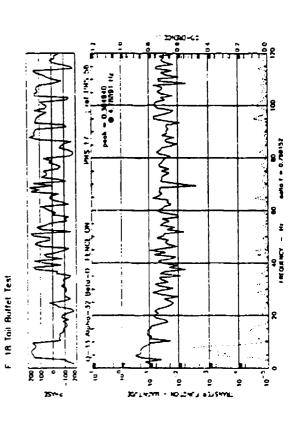


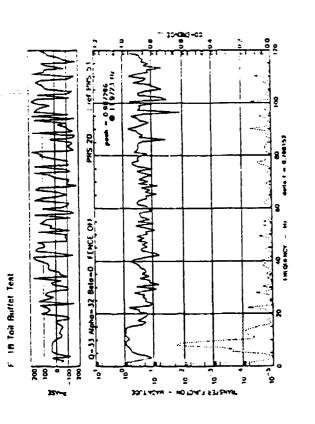


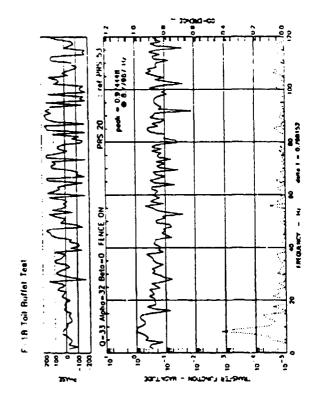


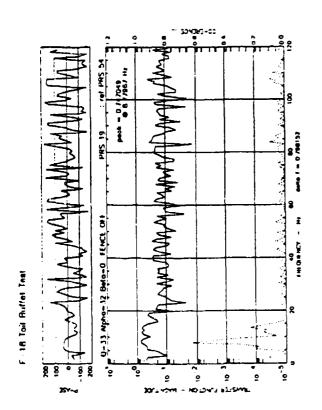


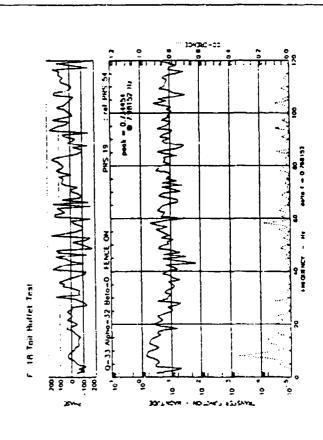


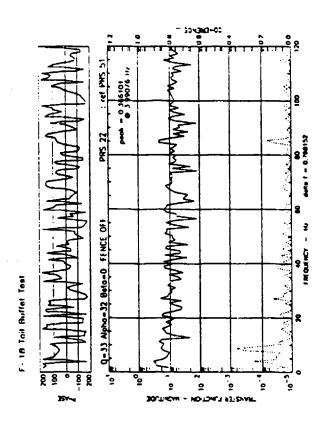


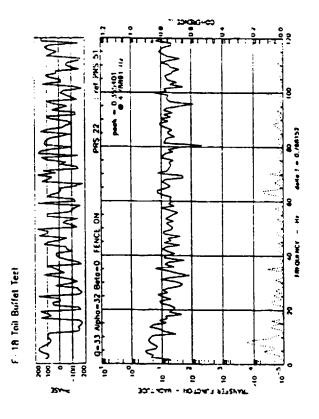


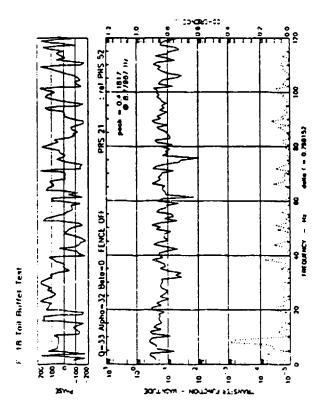


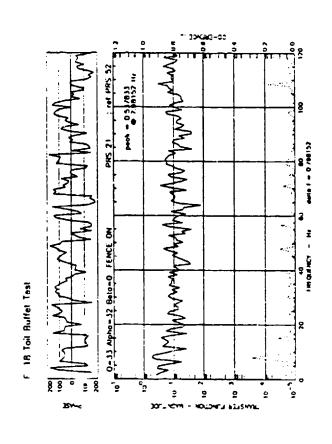


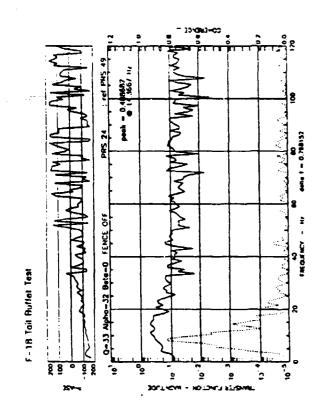


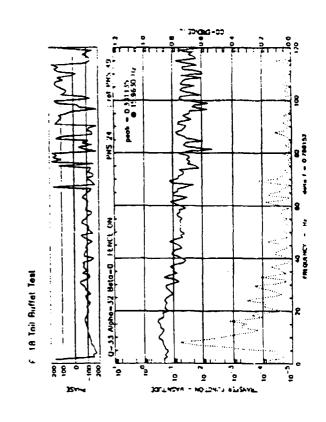


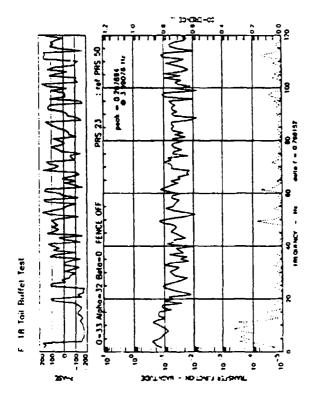


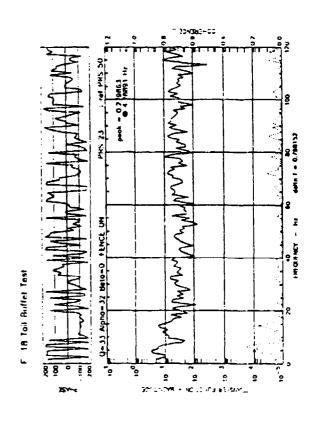


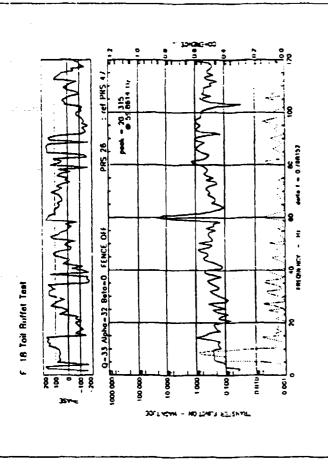


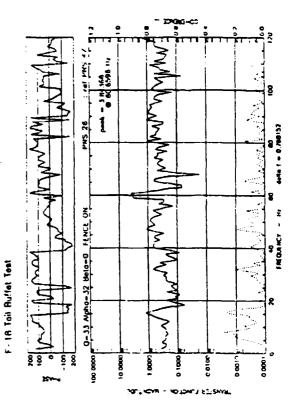


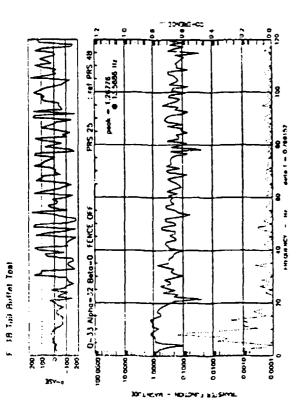


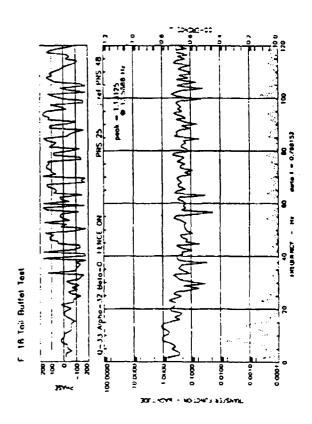


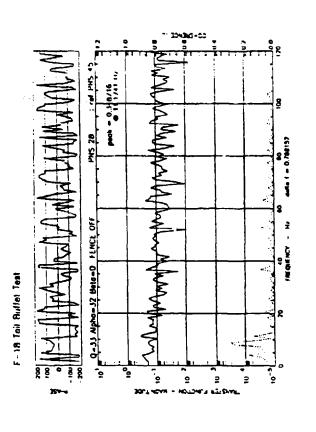


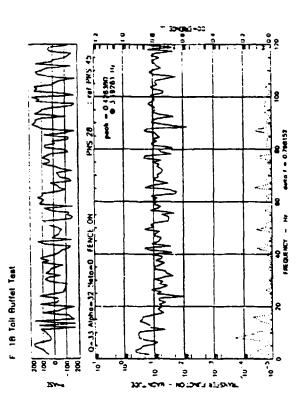


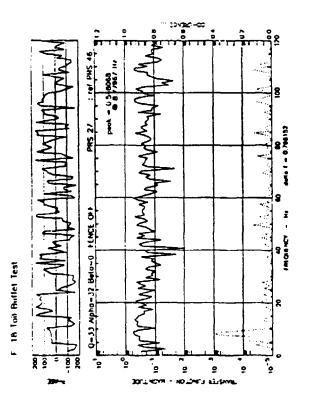


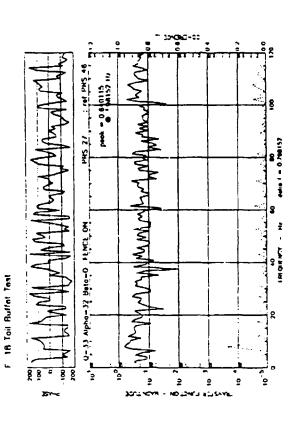


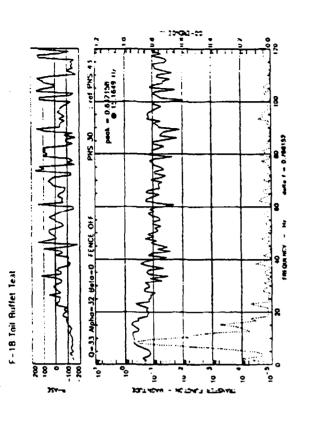


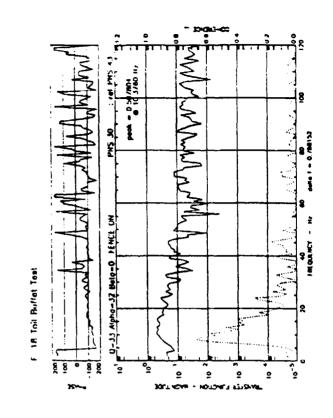


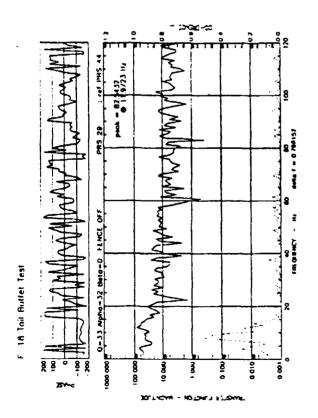


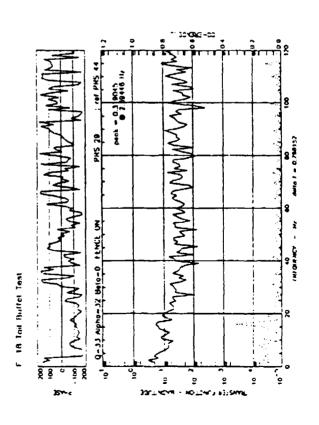


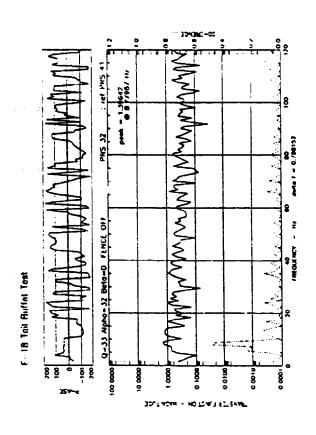


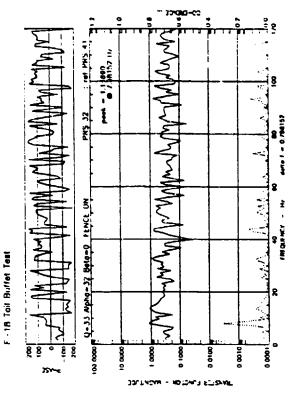


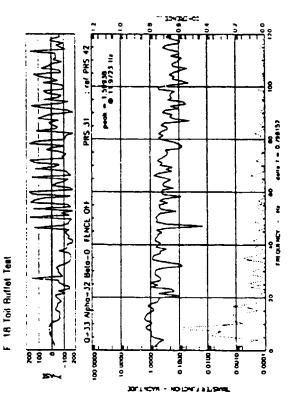


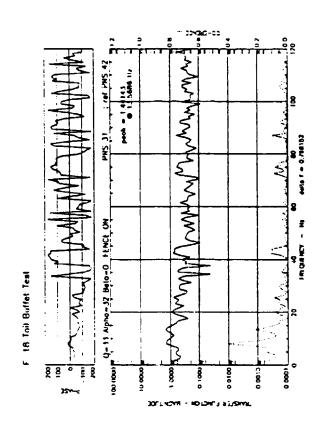


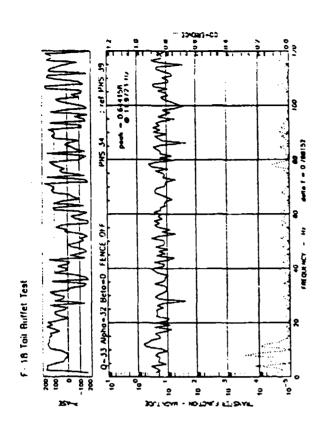


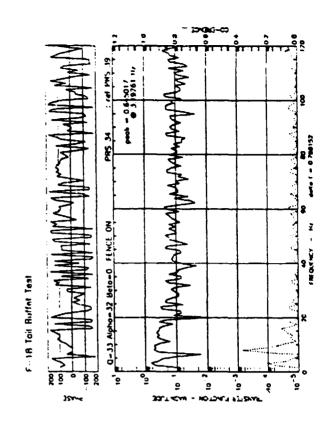


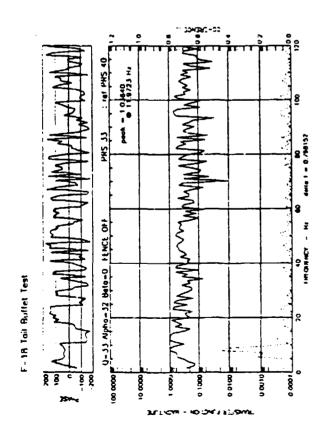


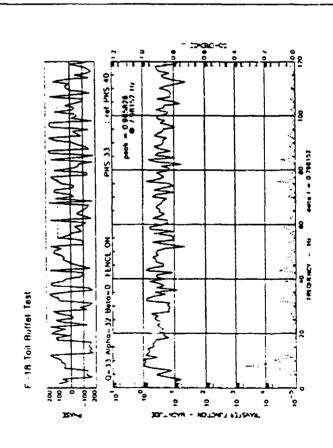


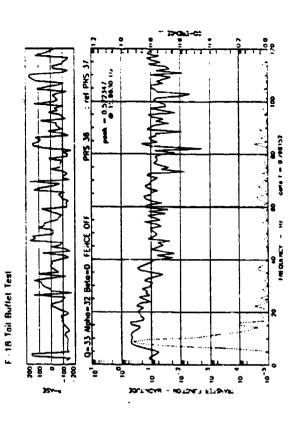


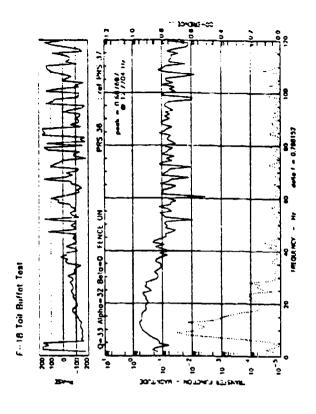


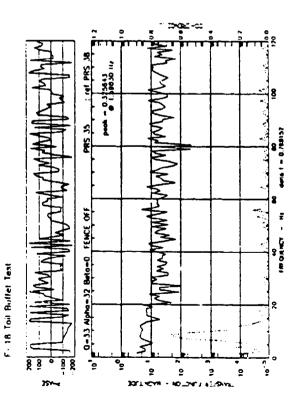


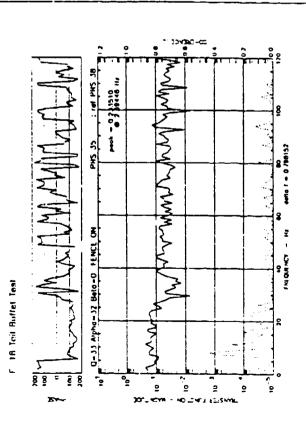










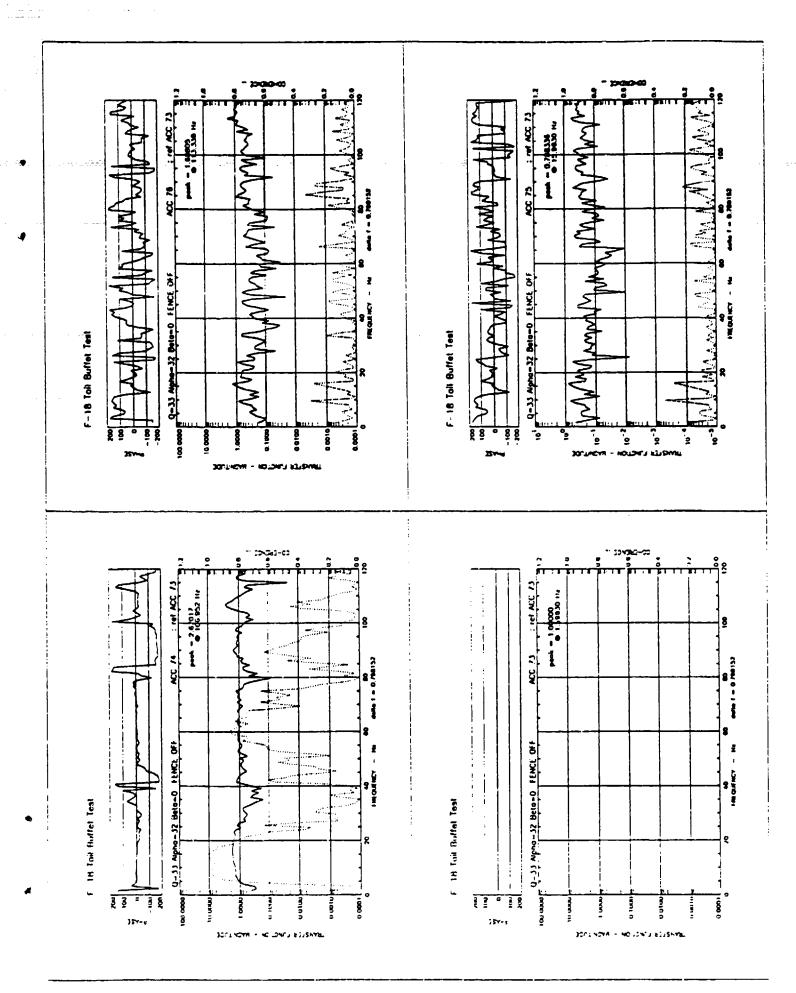


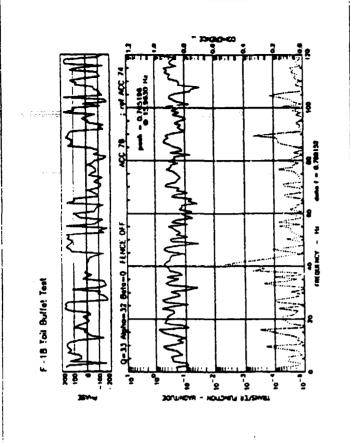
Fin-Tip Acceleration Cross Spectral Densities

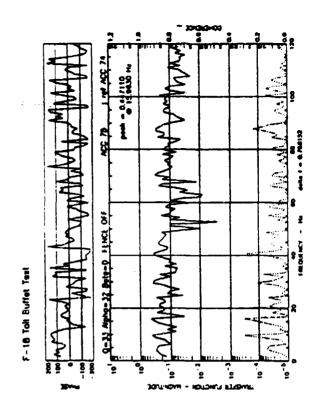
$$\alpha = 32^{\circ}$$
, $\beta = 0^{\circ}$, $Q = 33$ psf
(LEX fence OFF)

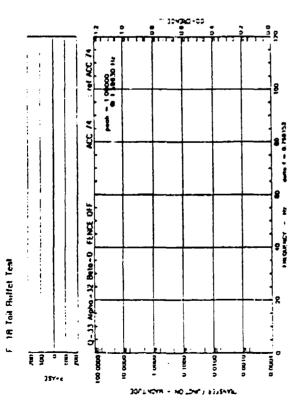
Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers being analyzed are listed near the upper right of each chart. Accelerometer numbering is as follows:

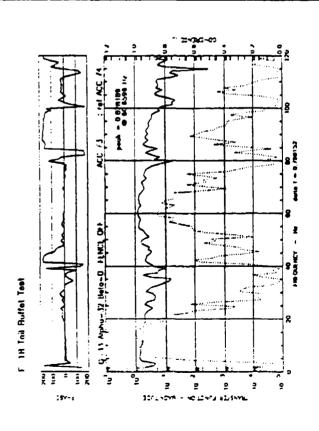
Accelerometer Number	Accelerometer Reference Name	Accelerometer Location	
73	P2	Port Fin — Aft	
74	P1	Port Fin — Fore	
75	S2	Starboard Fin — Aft	
76	S 1	Starboard Fin — Fore	

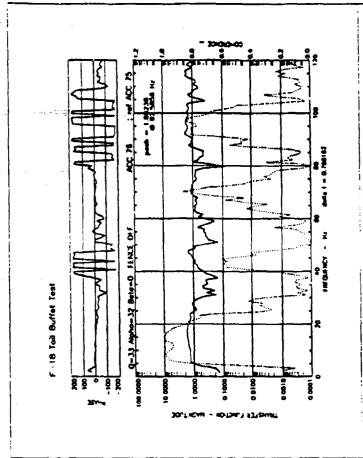


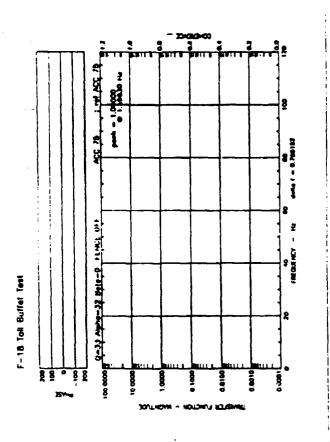


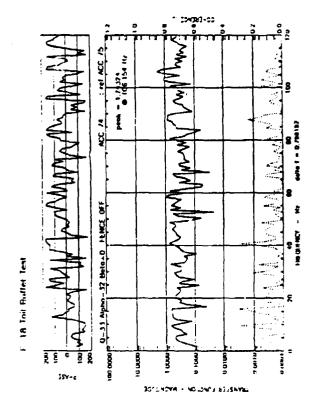


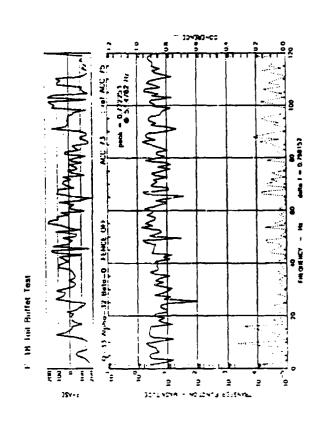


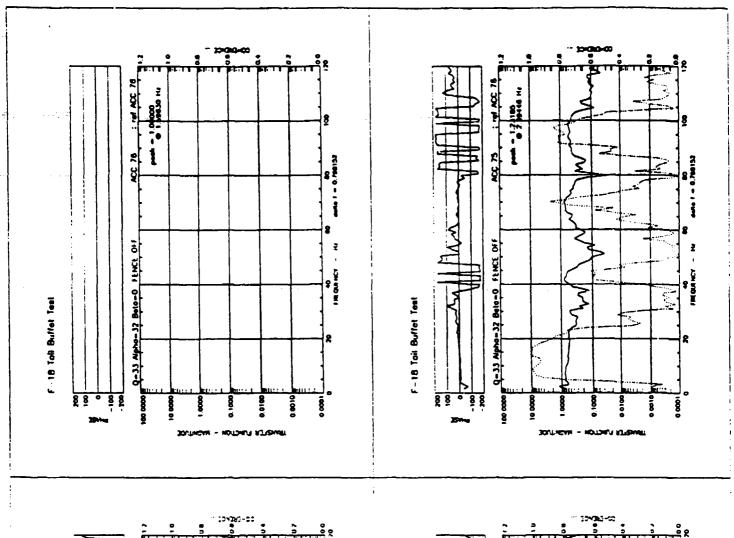


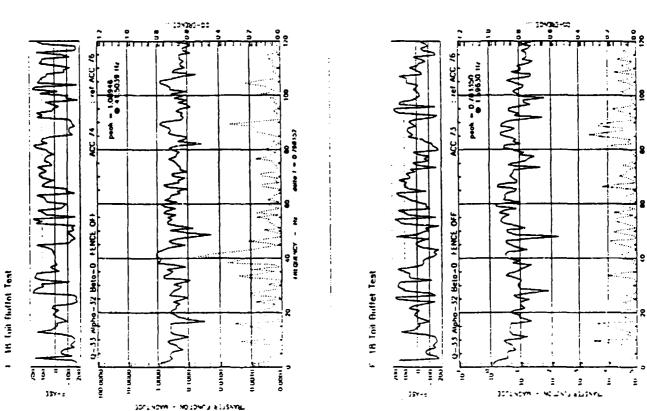










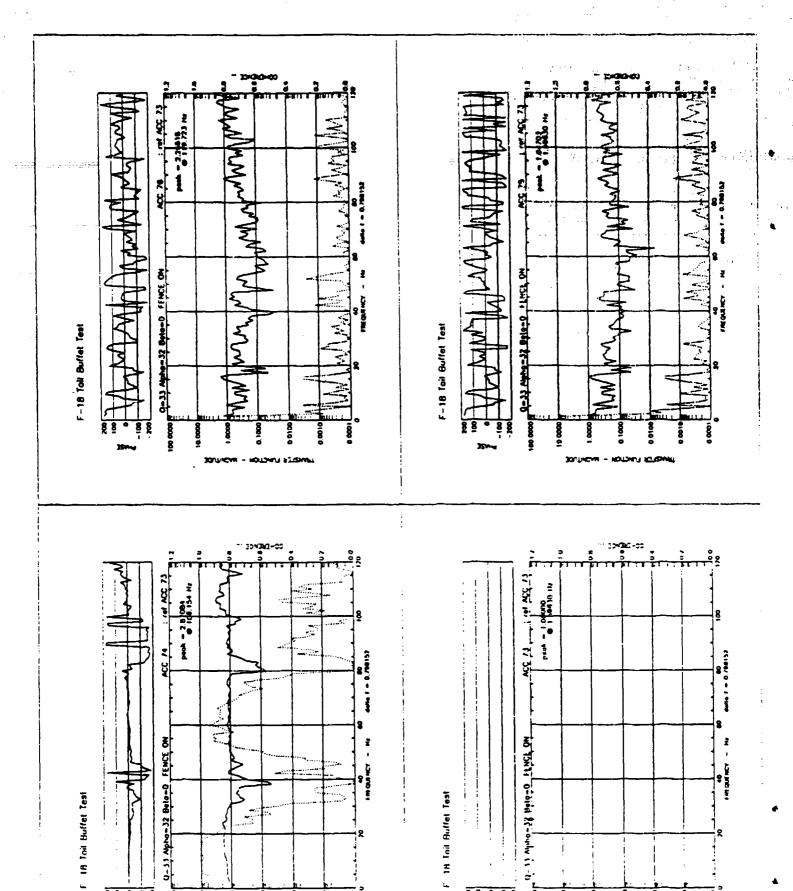


Fin-Tip Acceleratibit Cross Spectral Densities

$$\alpha = 32^{\circ}, \beta = 0^{\circ}, Q = 33 psf$$
(LEX fence ON)

Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers being analyzed are listed near the upper right of each chart. Accelerometer numbering is as follows:

Accelerometer Number	Accelerometer Reference Name	Accelerometer Location
73 ·	P2	Port Fin — Aft
74 :	Pl	Port Fin — Fore
75	S 2	Starboard Fin - Aft
76	SI	Starboard Fin - Fore



0.000

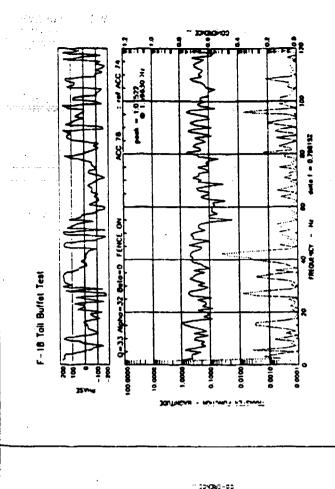
JOHNSON - NO LOWER BEISKARL

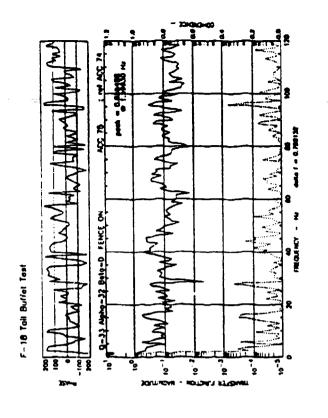
2 2

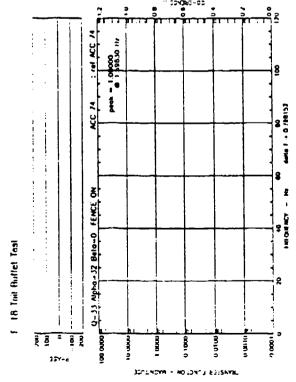
3 5

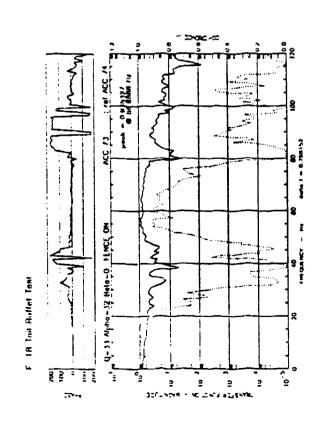
15v--

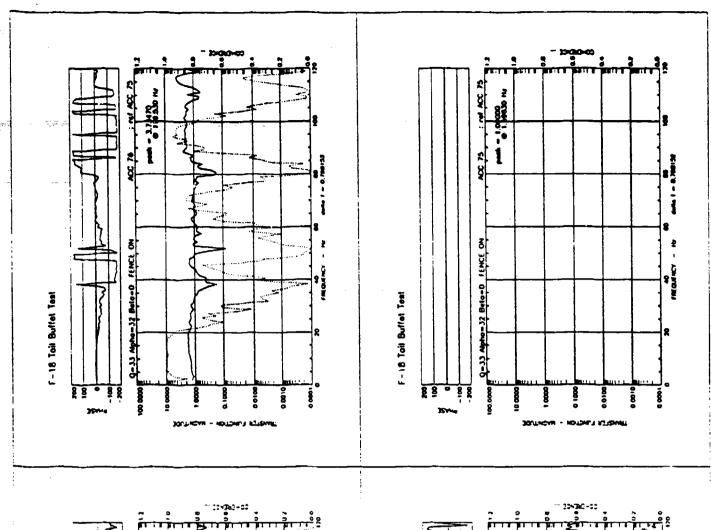
BOTENOMA - MOLENCY ELISANE

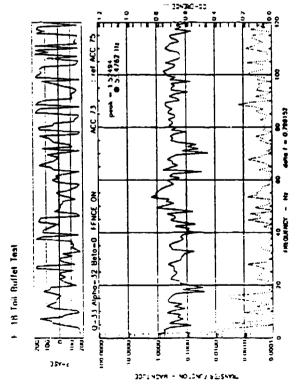


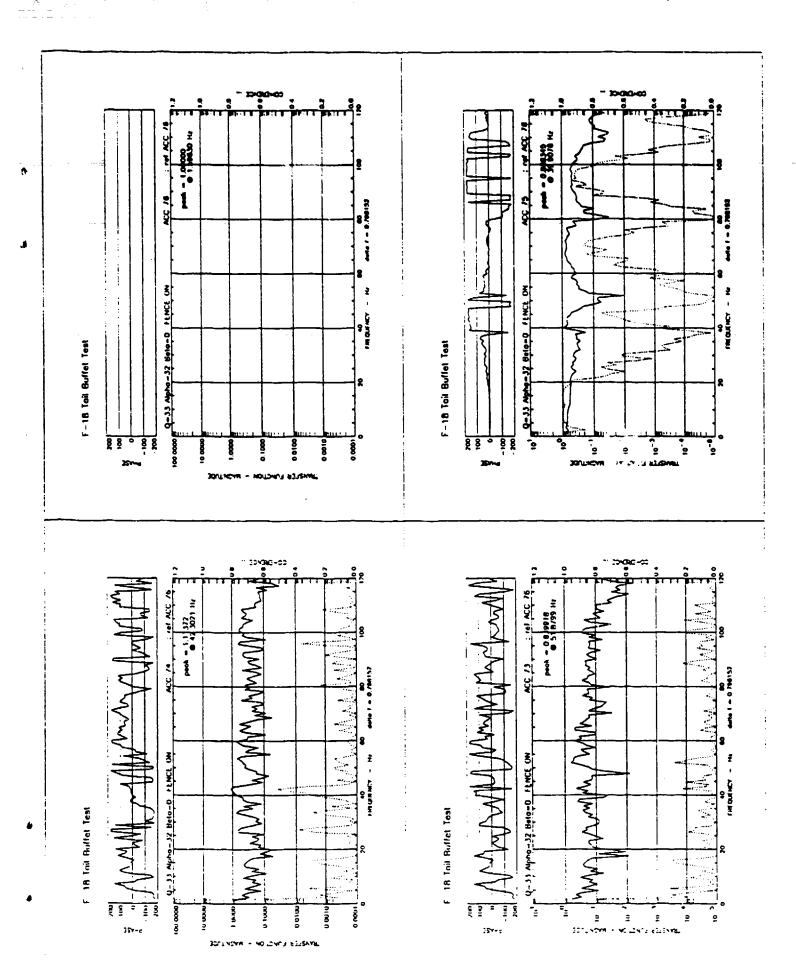












69U	6	9	0
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Cross Spectral Densities between Differential Pressure Coefficient at 10% Chord, 85% Span and Fin-Tip Accelerations

 $\alpha = 32^{\circ}$, $\beta = 0^{\circ}$, Q = 33 psf

Eight CSDs are included in this section. LEX fence OFF results appear on the first page in this section, and LEX fence ON results appear on the second. Within each quadrant of the page, the phase angle is displayed as the upper plot, and the coherence appears on the right-hand axis of the lower plot. The transducers being analyzed are listed near the upper right of each chart. Refer to the transducer reference numbers displayed in Figure 1.

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